Fig. 1

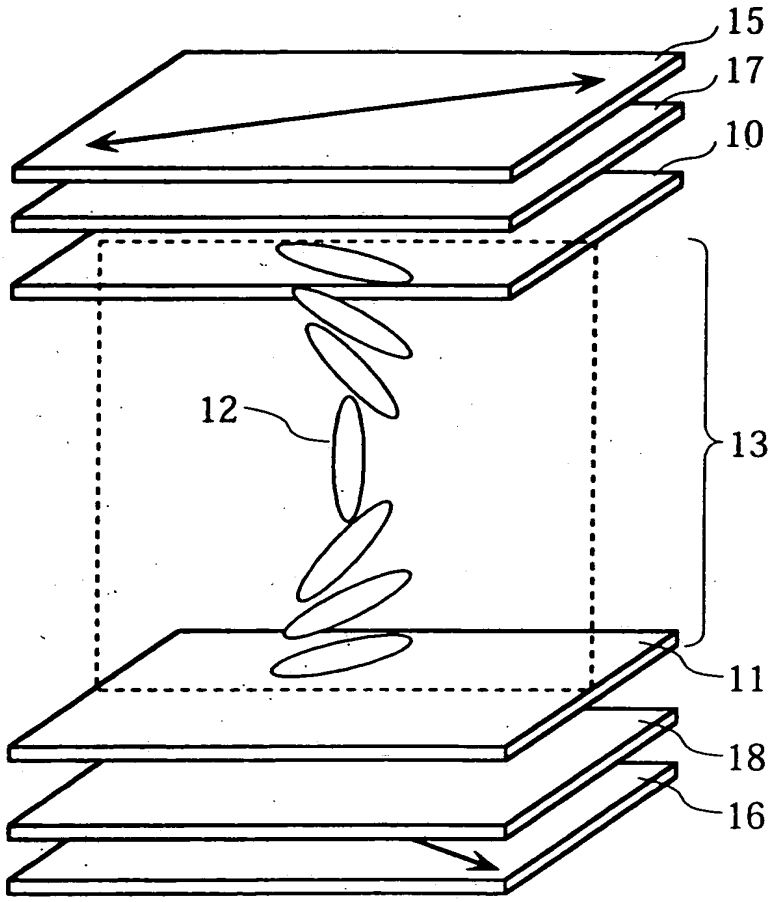


Fig. 2

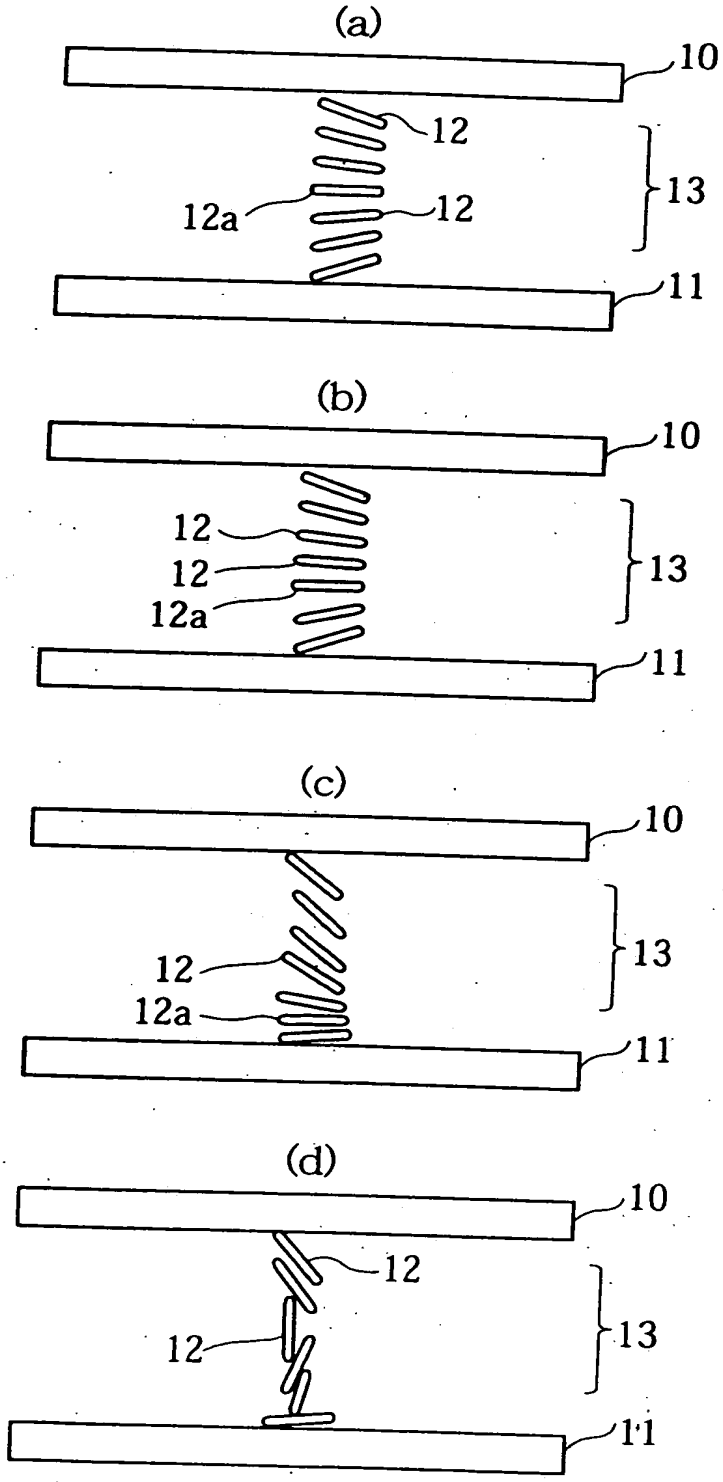

(a)
10
12
13
12a
12
11
(b)
10
12
12
12a
13
11
(c)
10
13
12
12a
11
(d)
10
12
12
13
11

Fig. 3

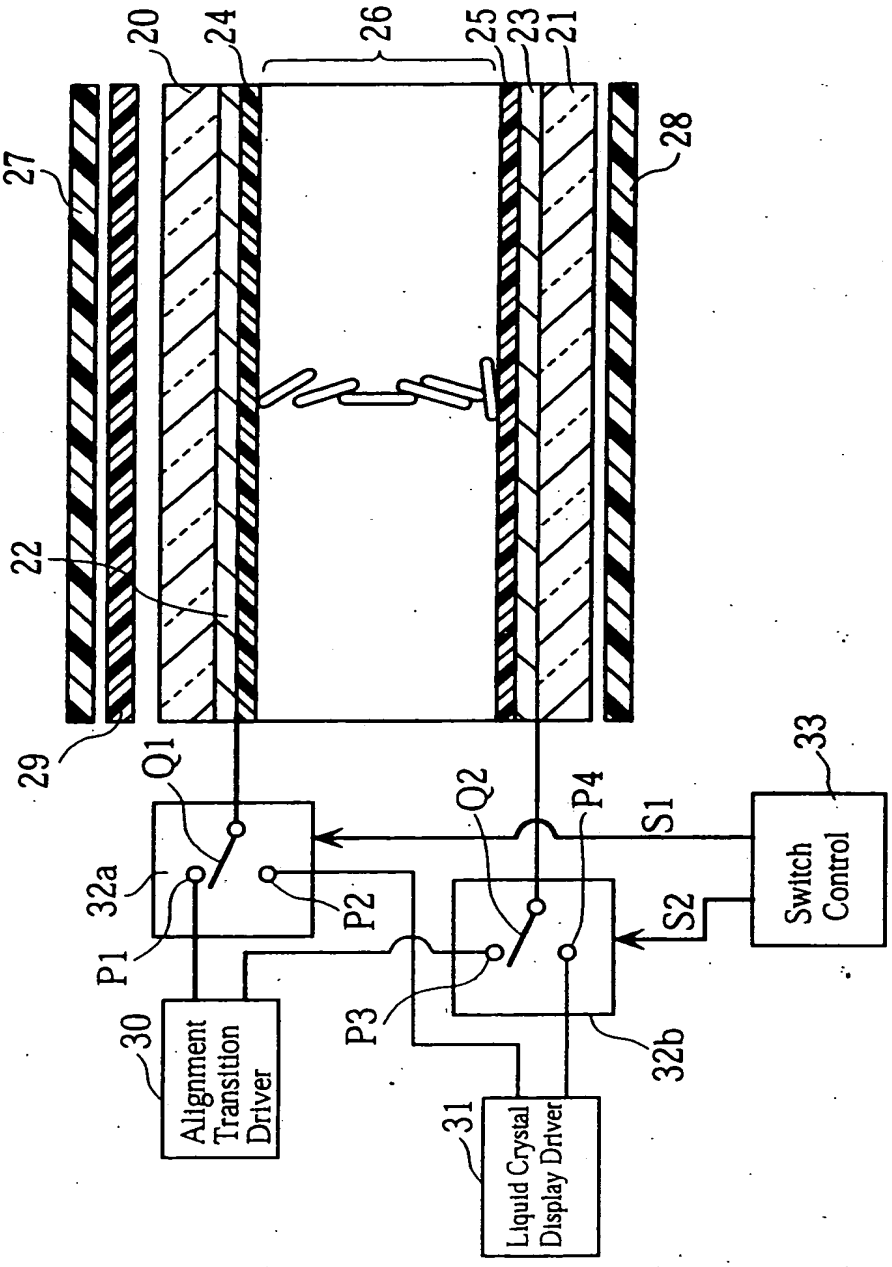

20
24
26
25
23
21
27
28
22
29
Q1
Q2
P4
S1
33
32a
P2
P1
P3
S2
Switch Control
30
Alignment Transition Driver
31
Liquid Crystal Display Driver
32b

Fig. 4

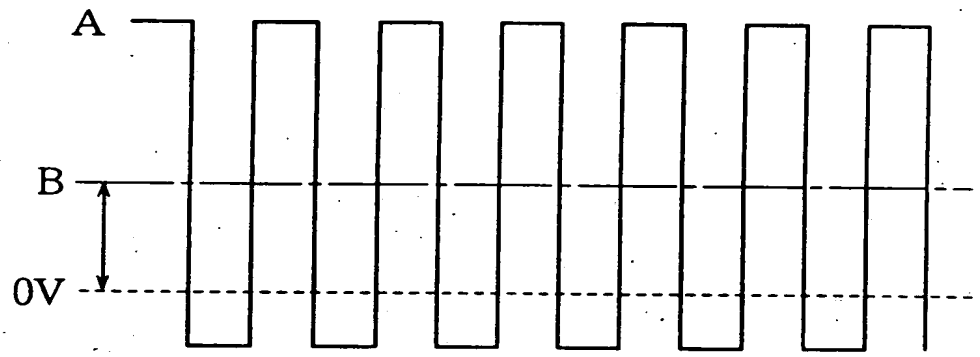


Fig. 5

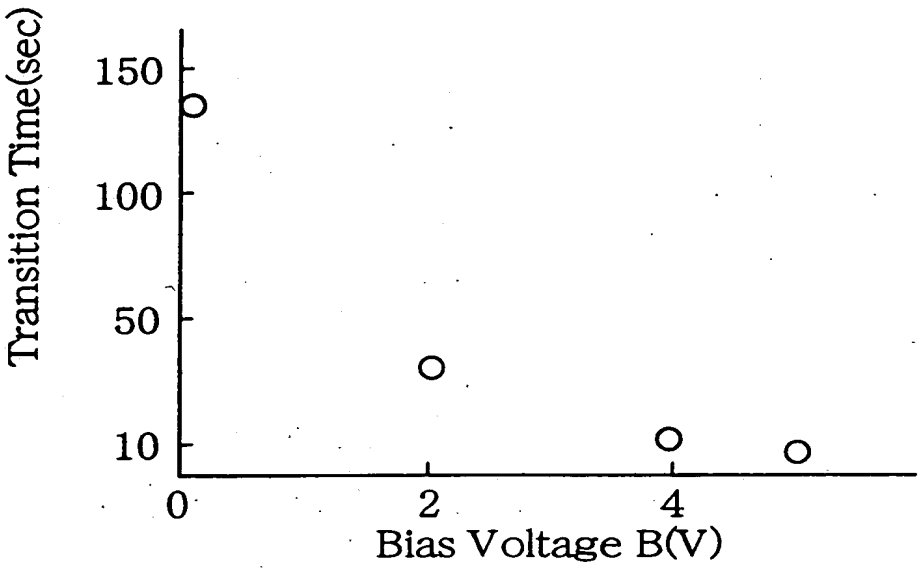


Fig. 6

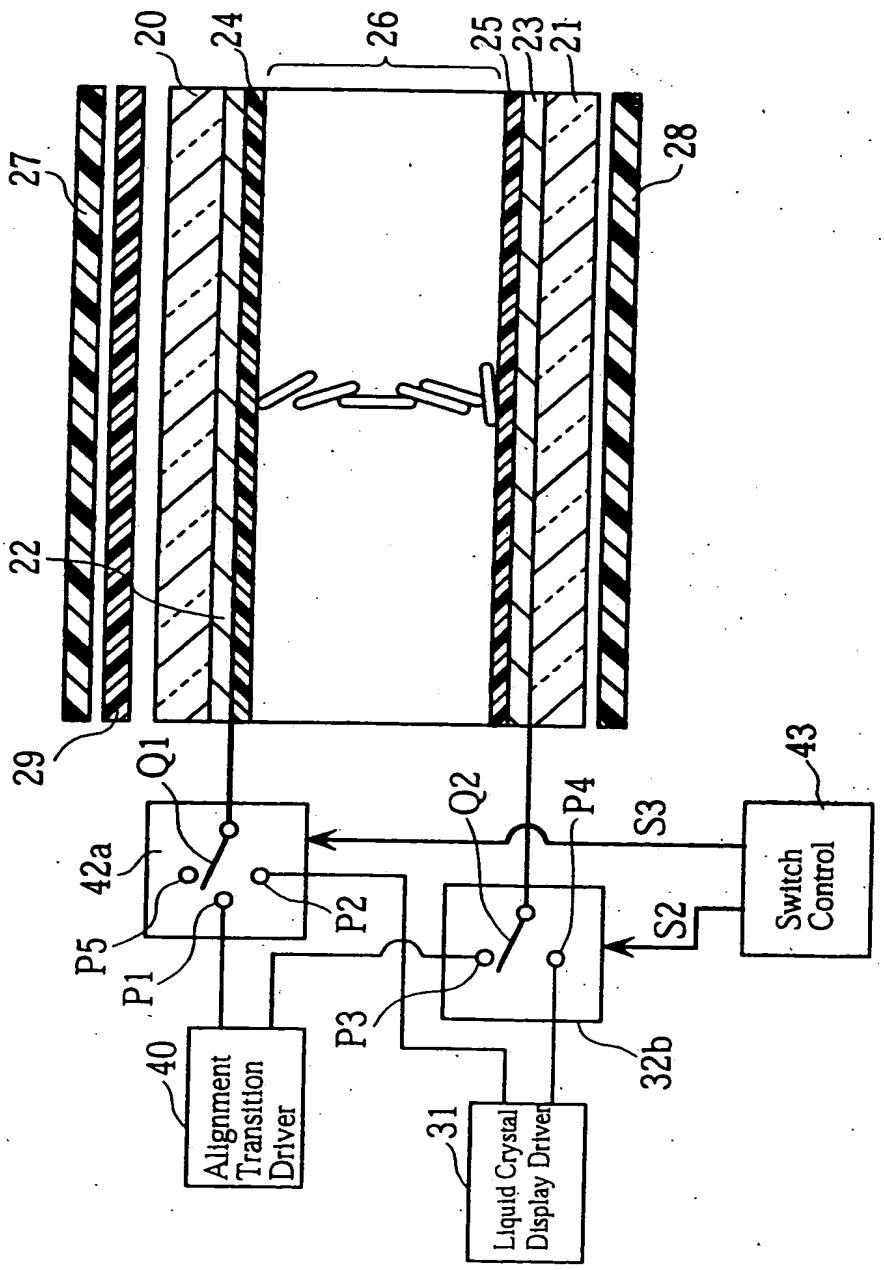

20
24
26
25
23
21
27
28
22
29
Q1
Q2
P4
S3
43
42a
P5
P1
P2
P3
S2
Switch Control
40
Alignment Transition Driver
31
Liquid Crystal Display Driver
32b

Fig. 7

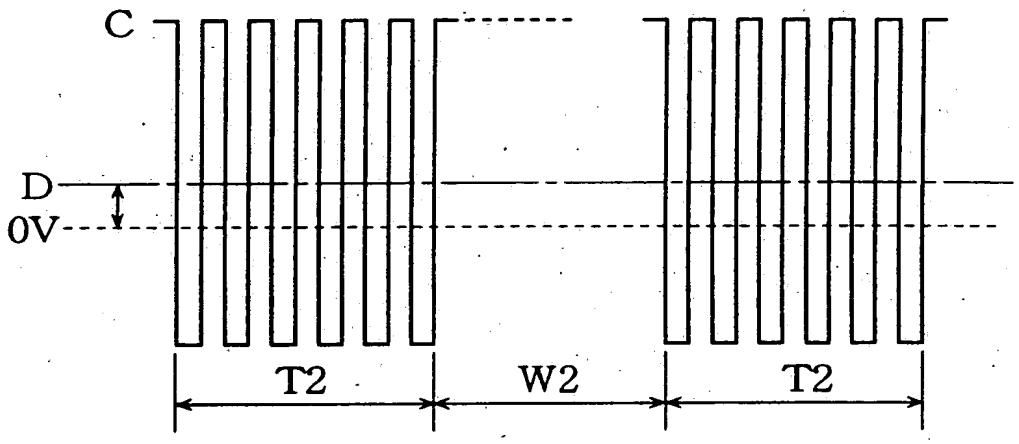


Fig. 8

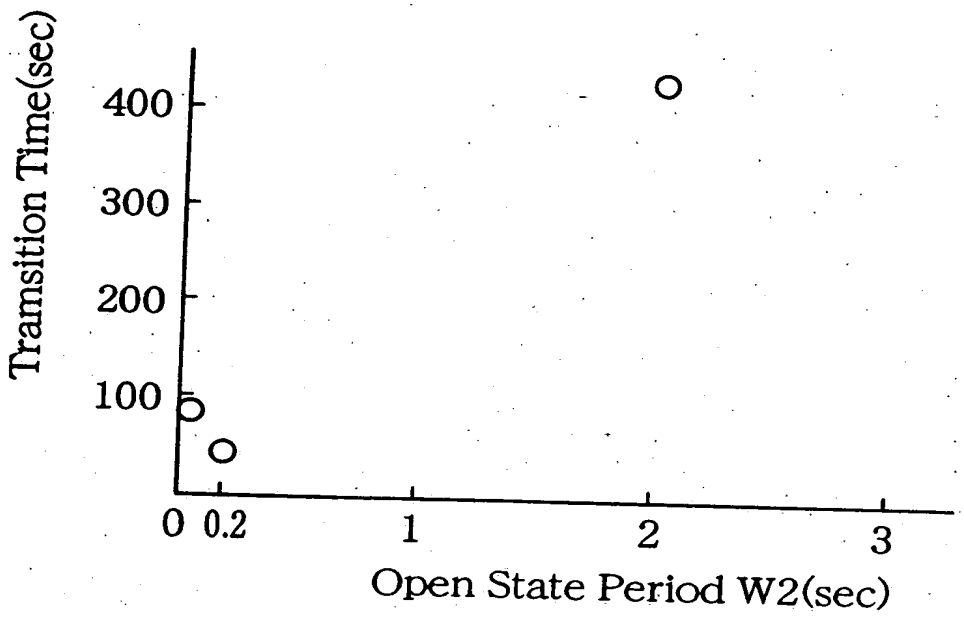

Tramsition Time(sec)
400
300
200
100
0
0.2
1
2
3
Open State Period W2(sec)

Fig. 9

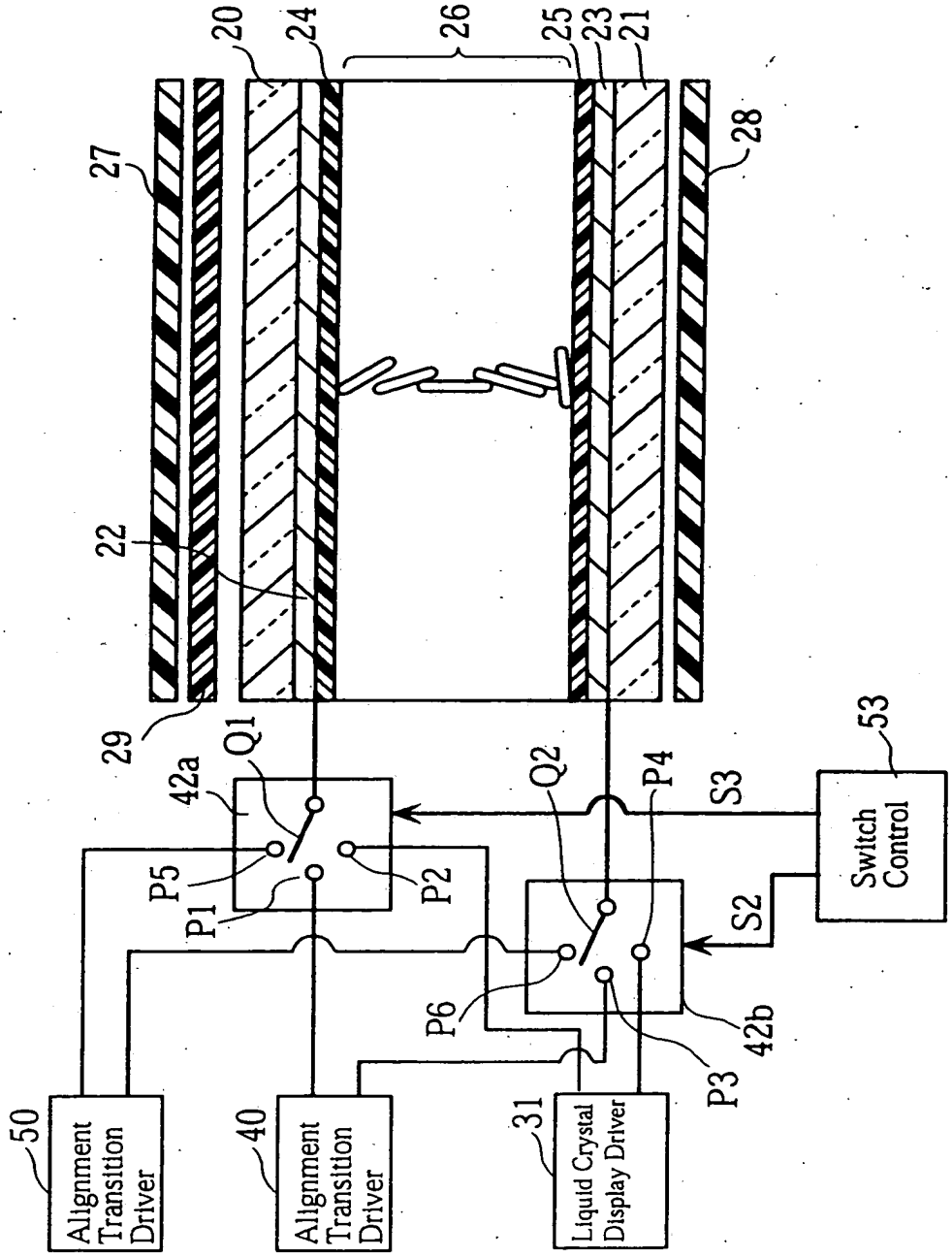

20
24
26
25
23
21
27
28
22
29
Q1
42a
Q2
P4
S3
53
Switch Control
P5
P1
P2
S2
P6
42b
P3
50
Alignment Transition Driver
40
Alignment Transition Driver
31
Liquid Crystal Display Driver

Fig. 10

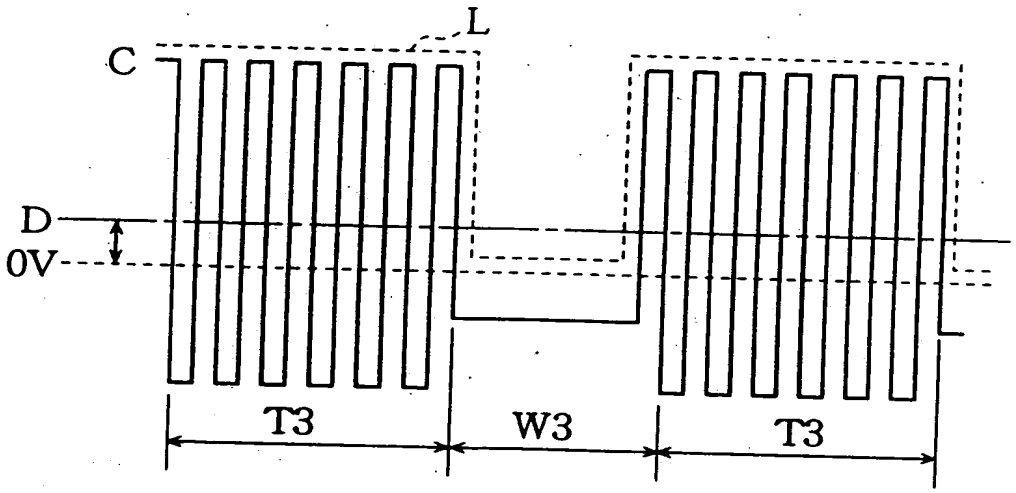


Fig. 11

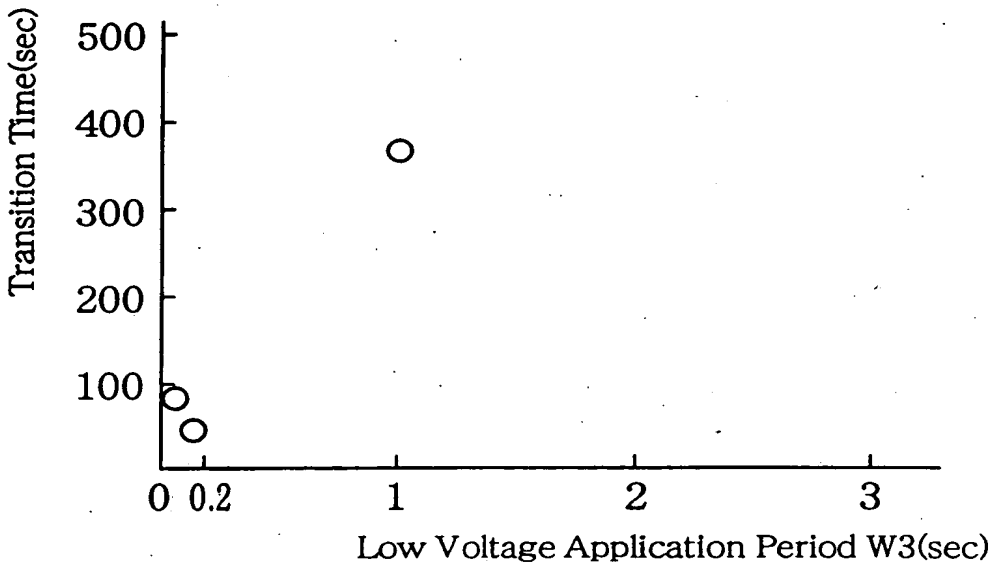

Transition Time(sec)
500
400
300
200
100
0
0.2
1
2
3
Low Voltage Application Period W3(sec)

Fig. 12

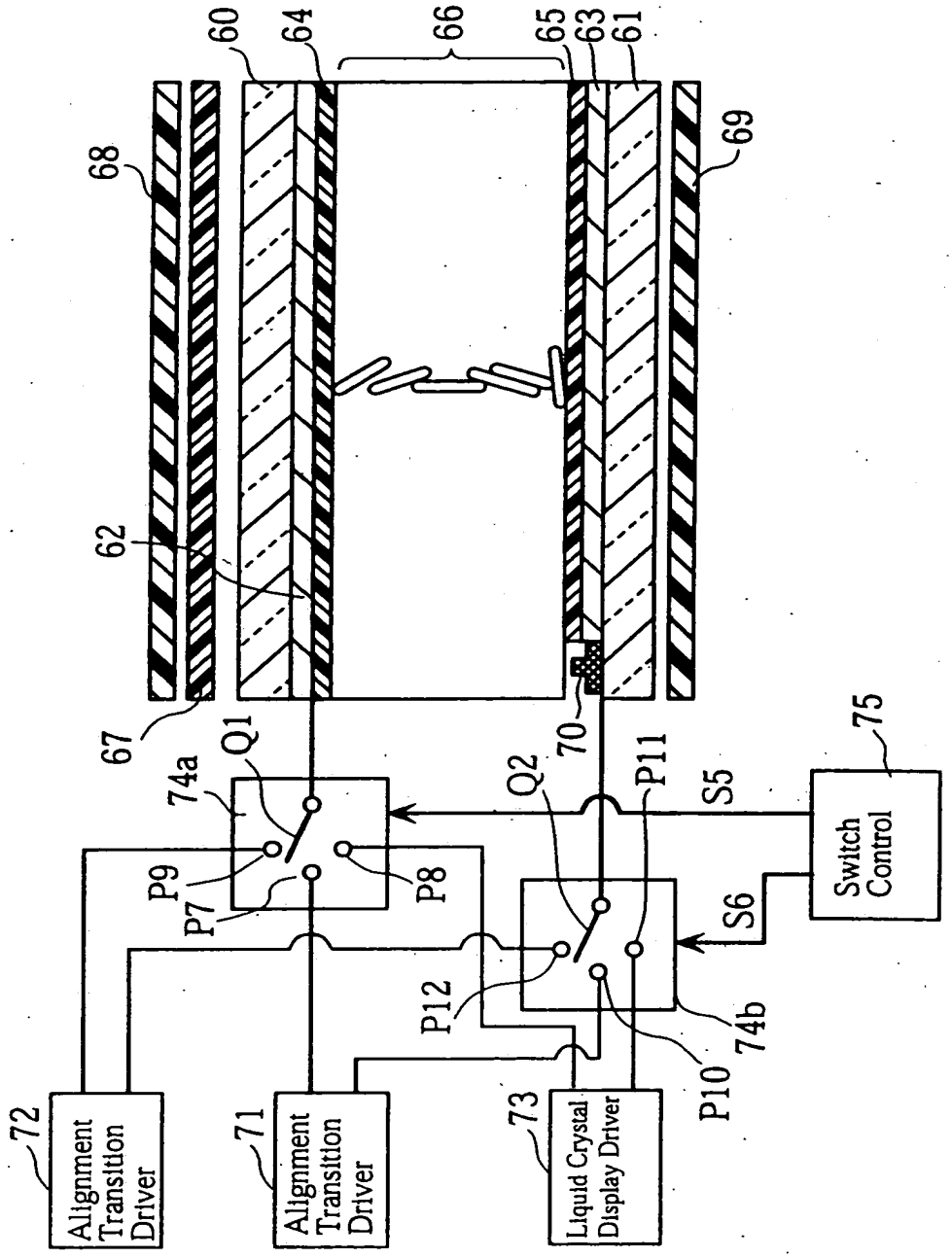

60
64
66
65
63
61
68
69
62
67
70
Q1
74a
Q2
P11
S5
75
Switch Control
P9
P7
P8
S6
P12
74b
P10
72
Alignment Transition Driver
71
Alignment Transition Driver
73
Liquid Crystal Display Driver

Fig. 13

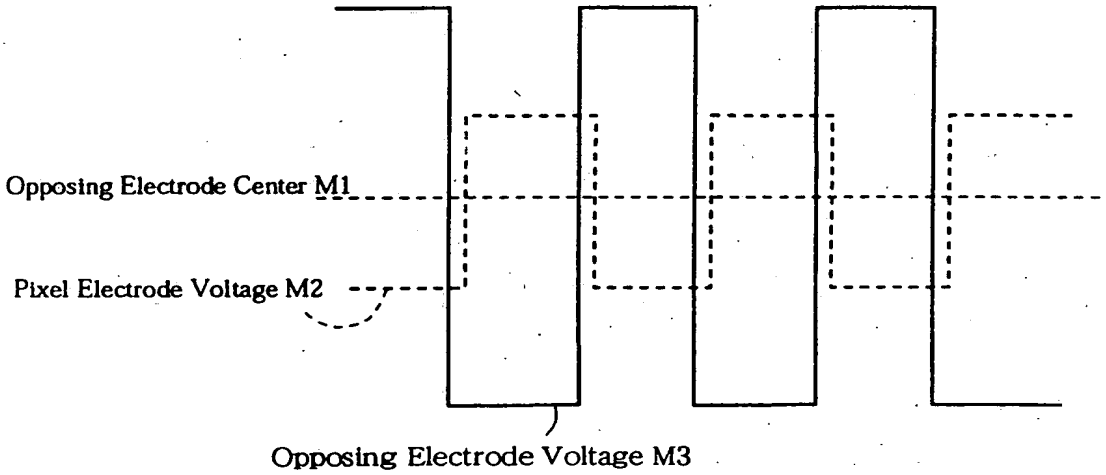

Opposing Electrode Center M1
Pixel Electrode Voltage M2
Opposing Electrode Voltage M3

Fig. 14

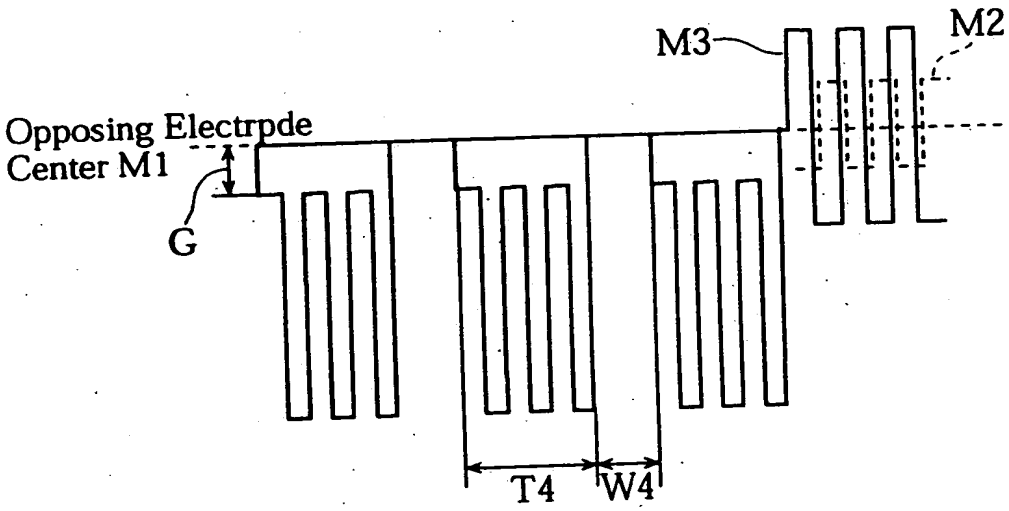


Fig. 15

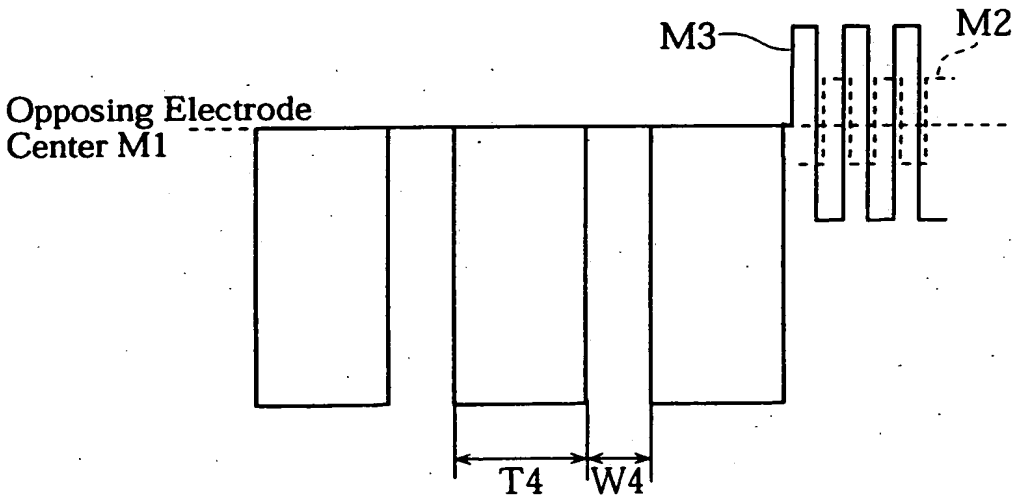


Fig. 16

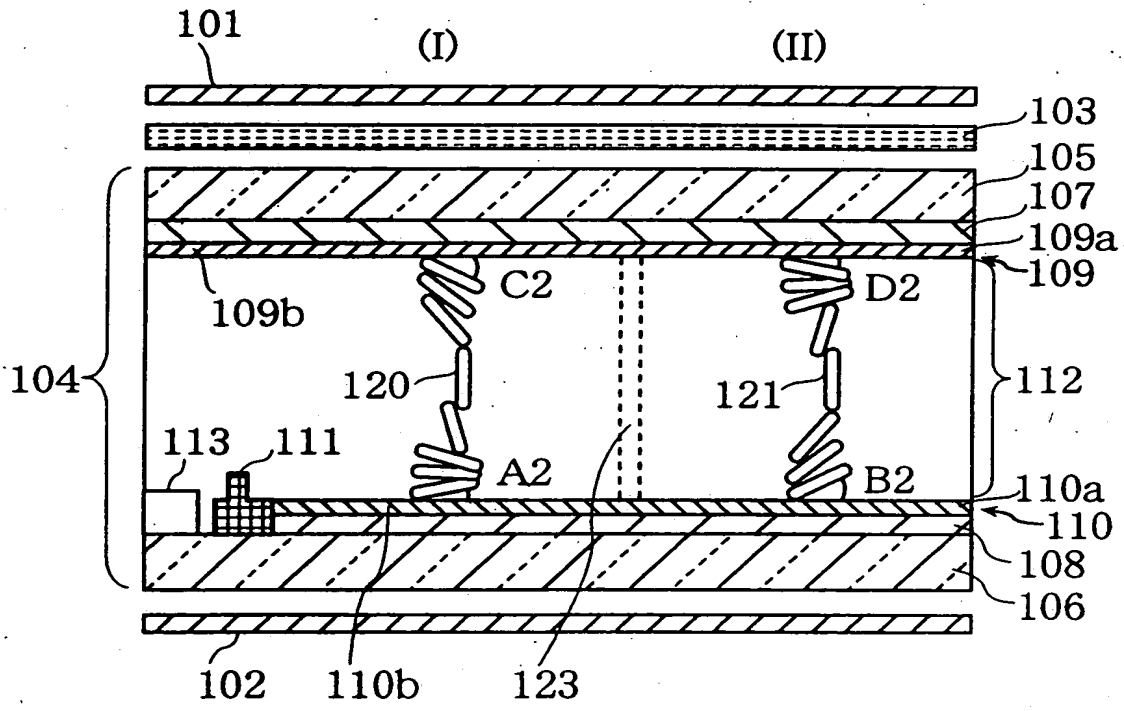

101
(I)
(II)
103
105
107
109a
109
109b
C2
D2
104
120
121
112
113
111
A2
B2
110a
110
108
106
102
110b
123

Fig. 17

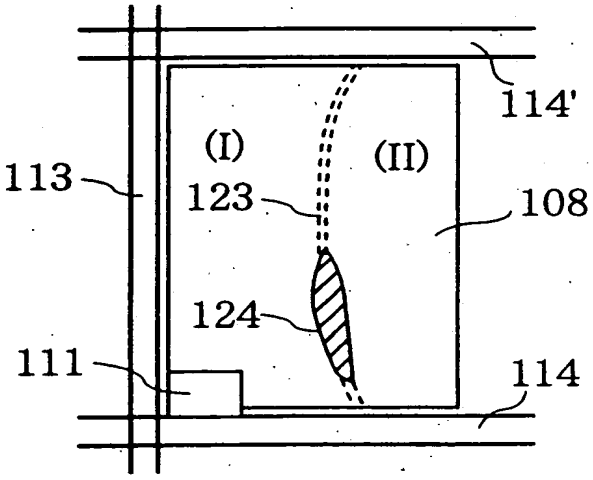


Fig. 18

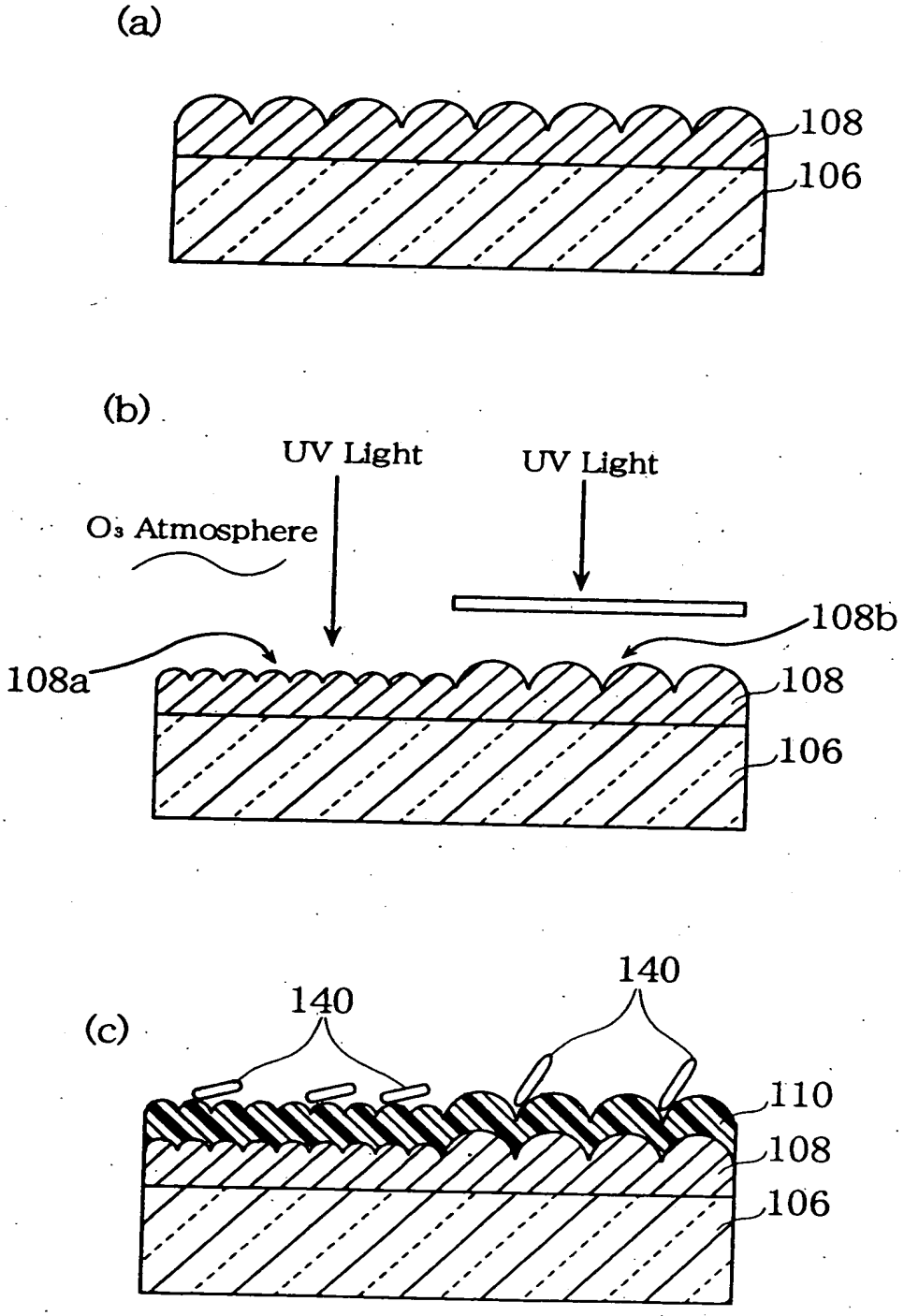
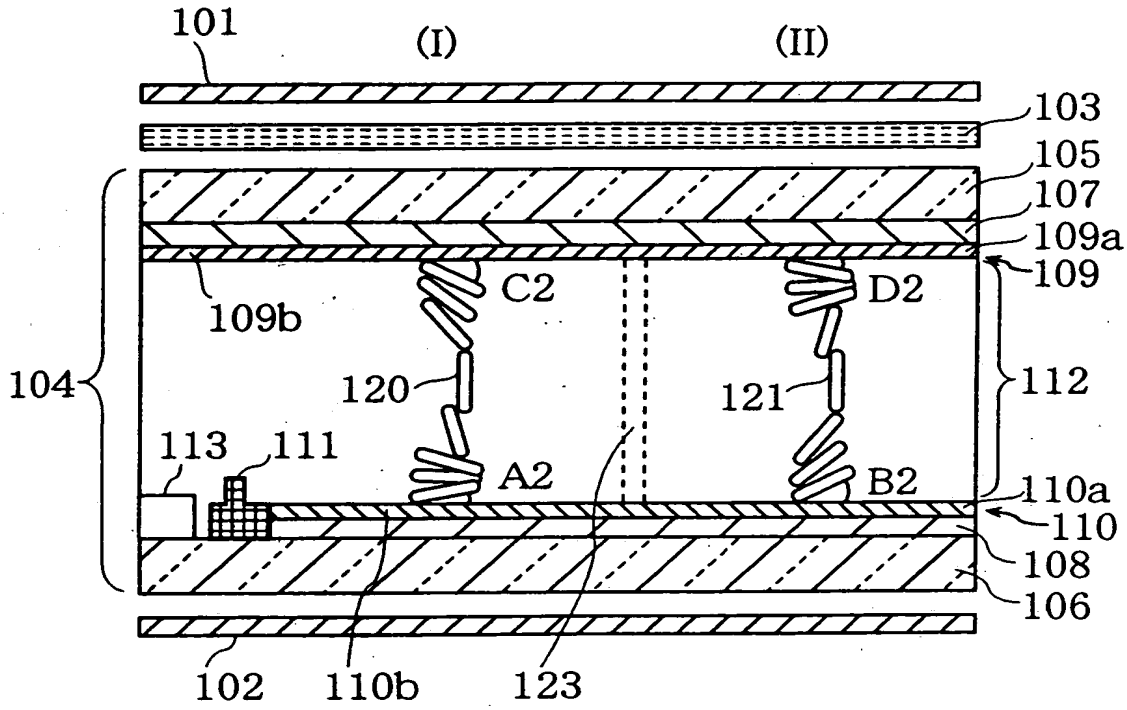

(a)
108
106
(b)
UV Light
UV Light
O3 Atmosphere
108b
108a
108
106
(c)
140
140
110
108
106

Fig. 19

(a)


101
(I)
(II)
103
105
107
109a
109
109b
C2
D2
104
120
121
112
113
111
A2
B2
110a
110
108
106
102
110b
123

(b)

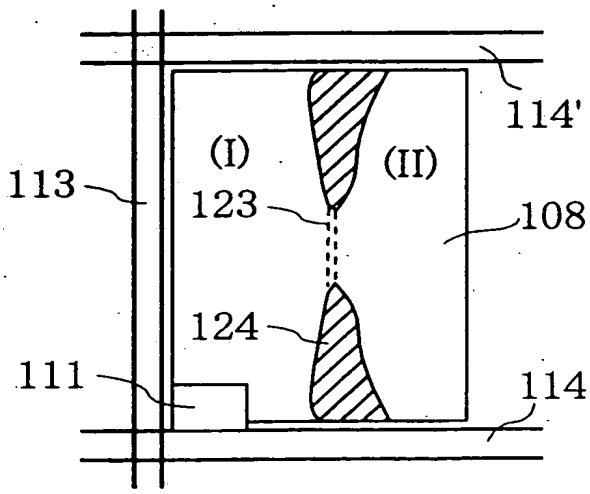

114'
(I)
(II)
113
123
108
124
111
114

Fig. 20

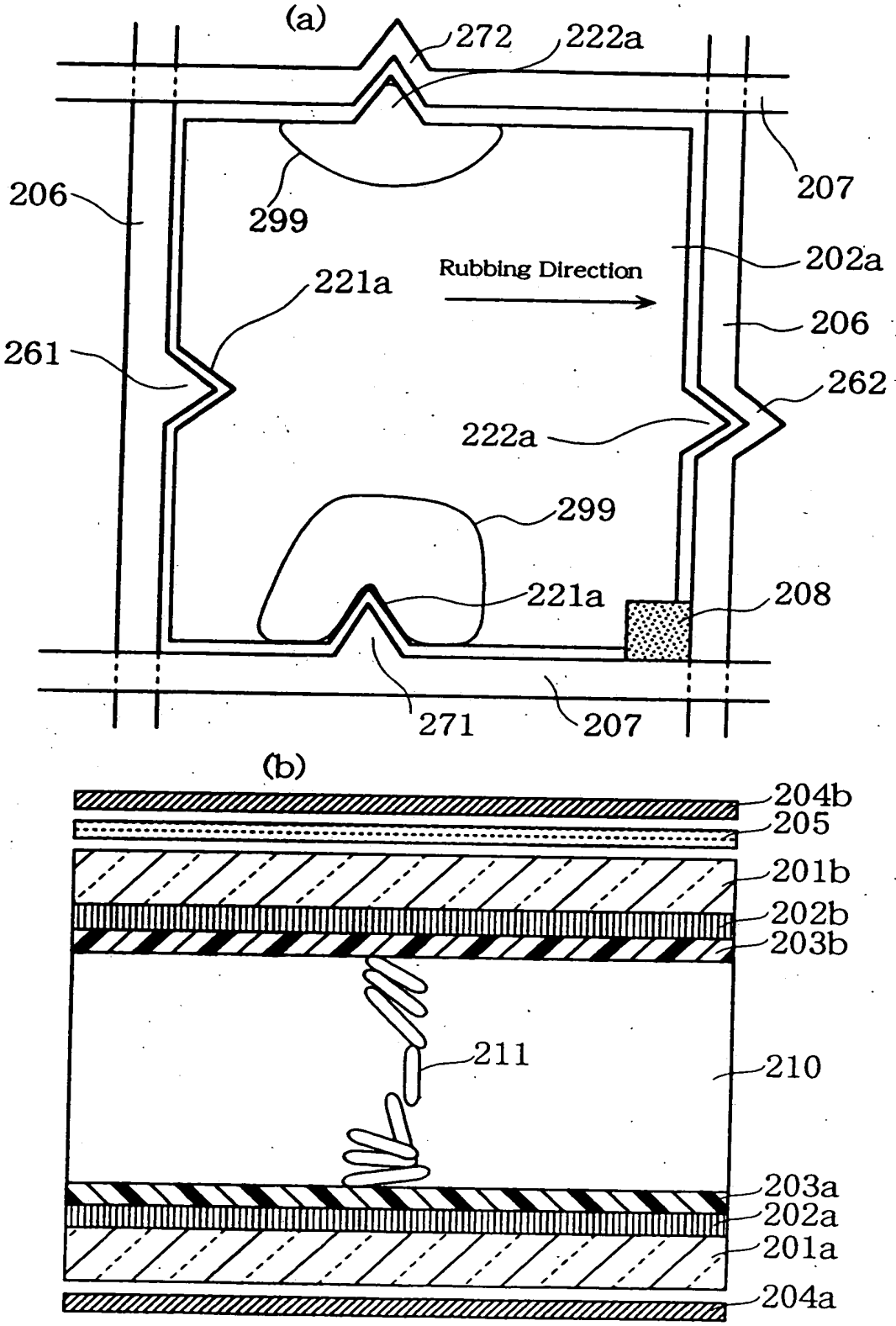

(a)
272
222a
207
206
299
202a
Rubbing Direction
221a
206
261
262
222a
299
221a
208
271
207
(b)
204b
205
201b
202b
203b
211
210
203a
202a
201a
204a

Fig. 21

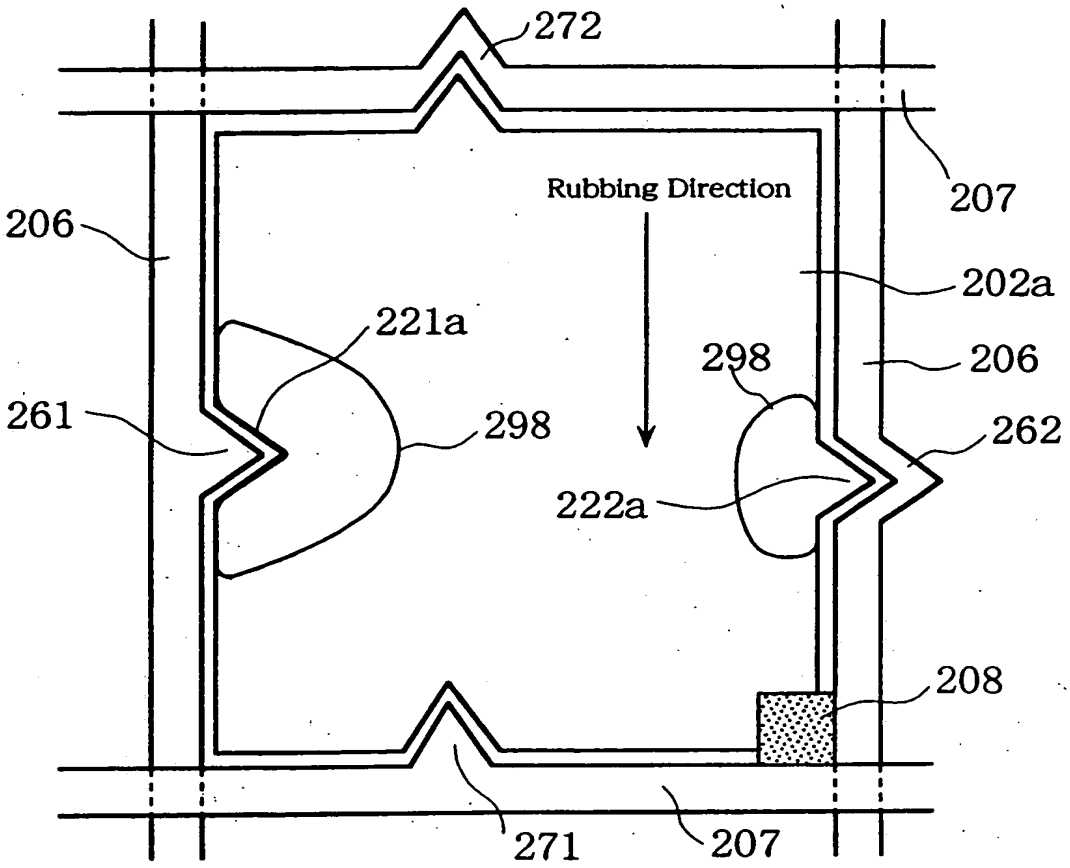

272
207
Rubbing Direction
206
202a
221a
298
206
261
298
262
222a
208
271
207

Fig. 22

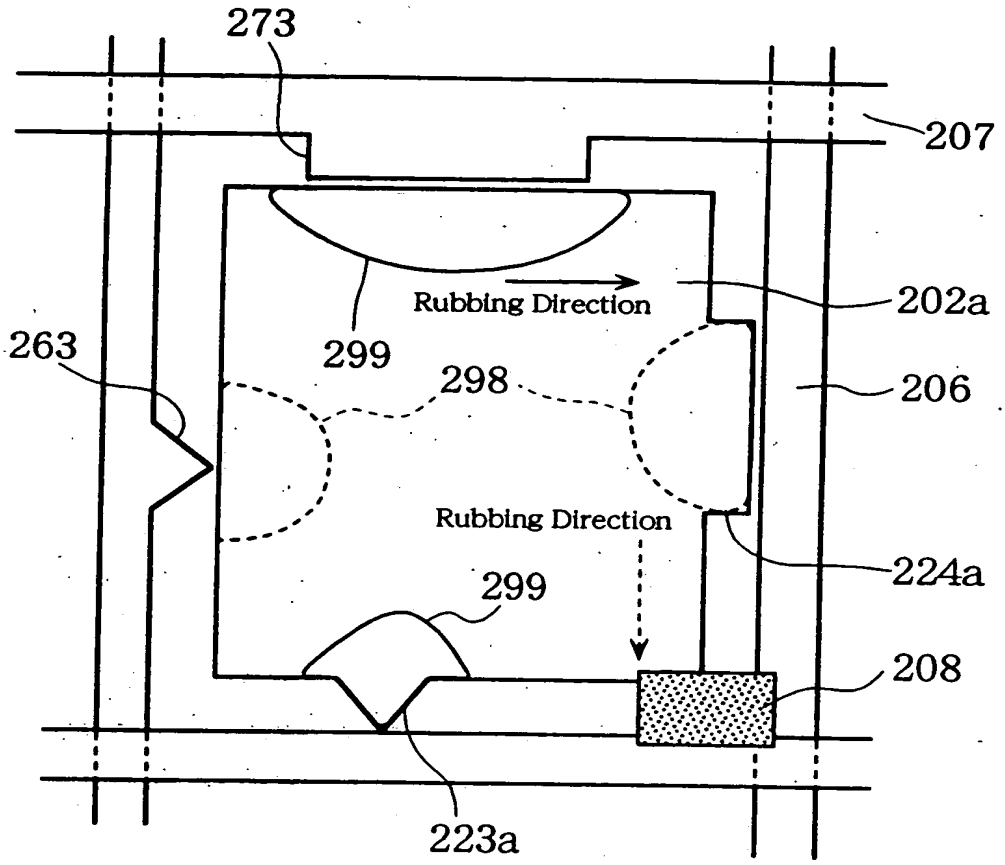

273
207
Rubbing Direction
202a
263
299
298
206
Rubbing Direction
224a
299
208
223a

Fig. 23

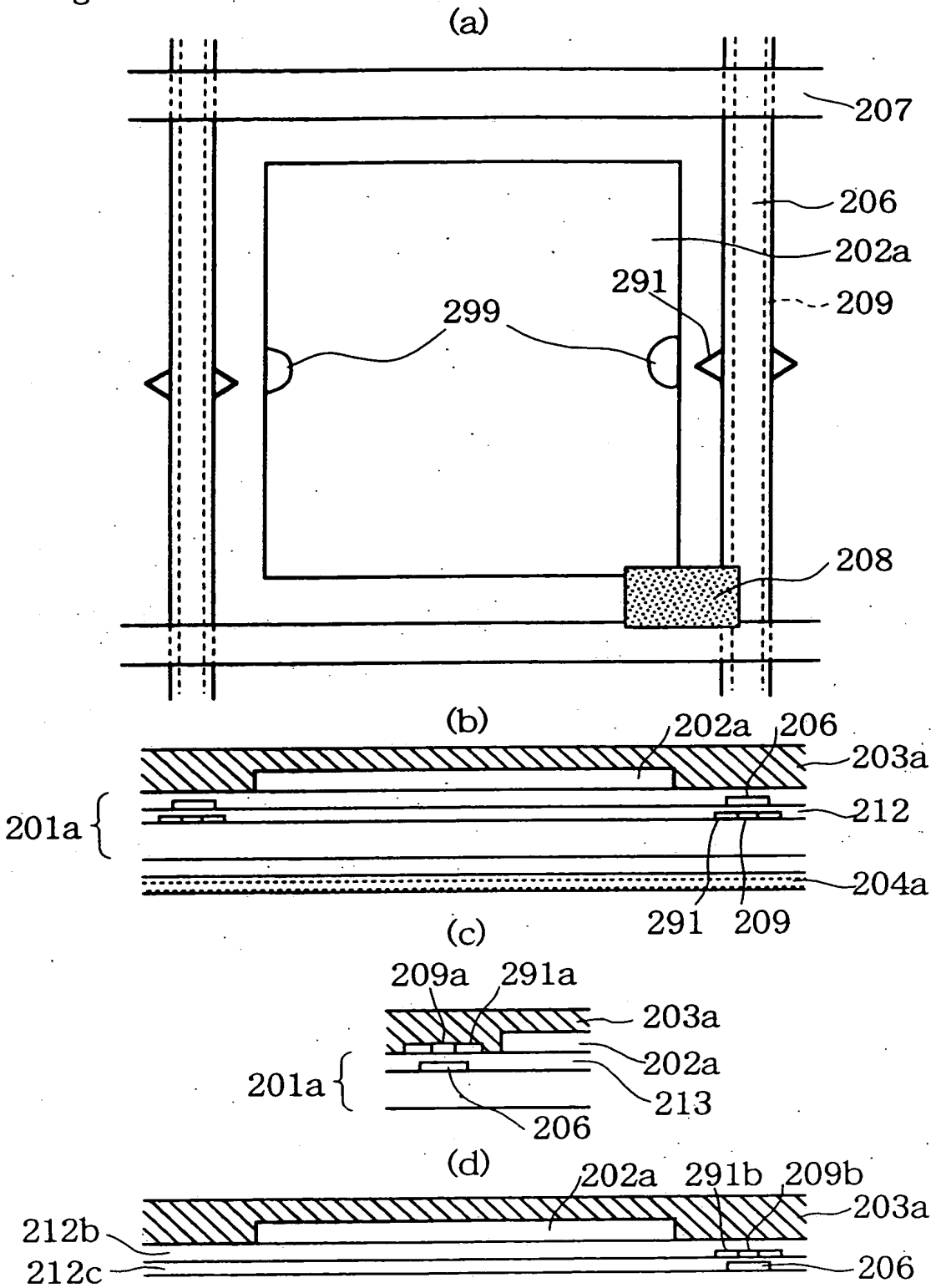

(a)
207
206
202a
291
209
299
208
(b)
202a
206
203a
201a
212
204a
291
209
(c)
209a
291a
203a
202a
201a
213
206
(d)
202a
291b
209b
203a
212b
212c
206

Fig. 24

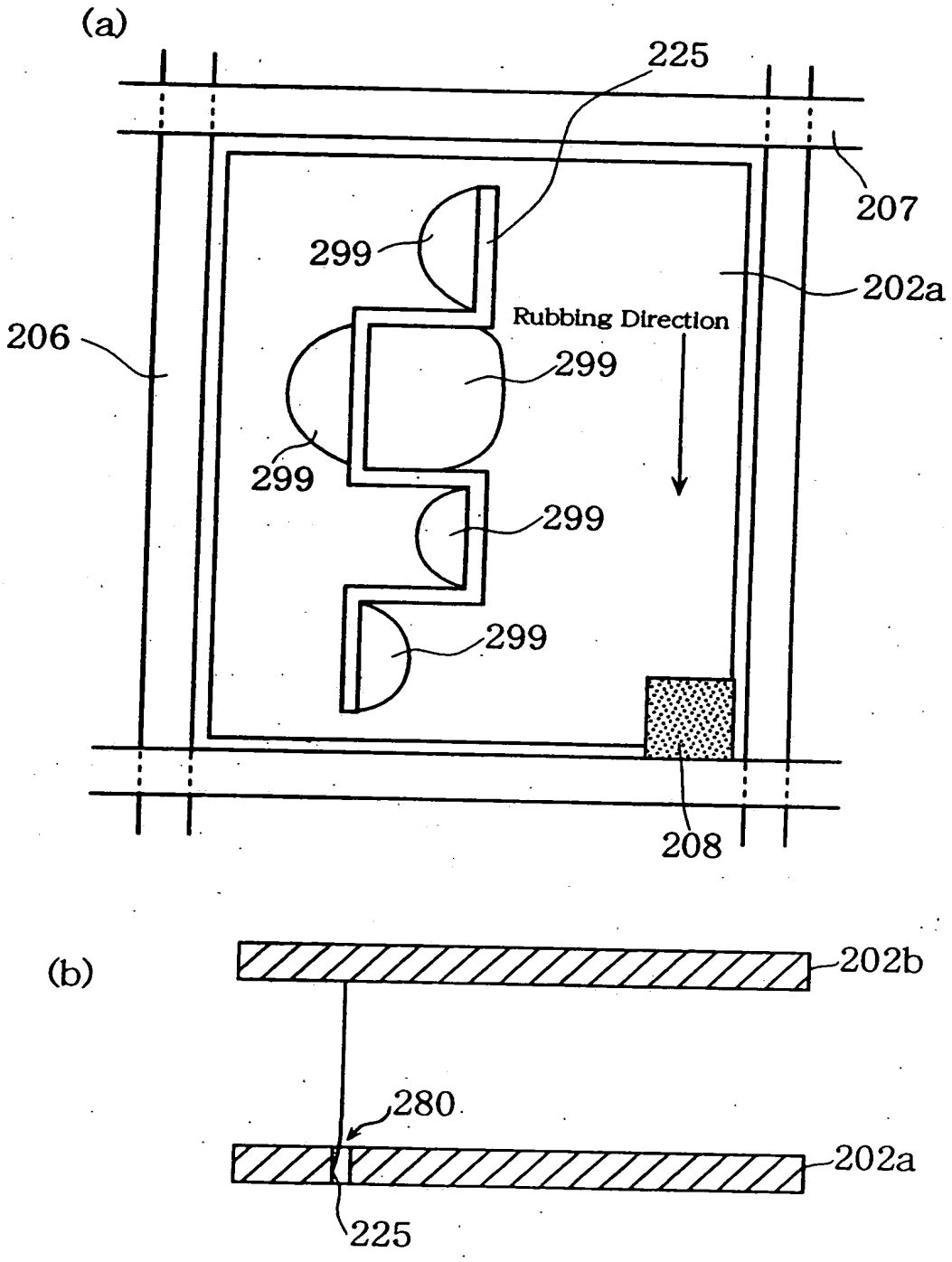

(a)
225
207
299
202a
206
Rubbing Direction
299
299
299
299
208
(b)
202b
280
202a
225

Fig. 25

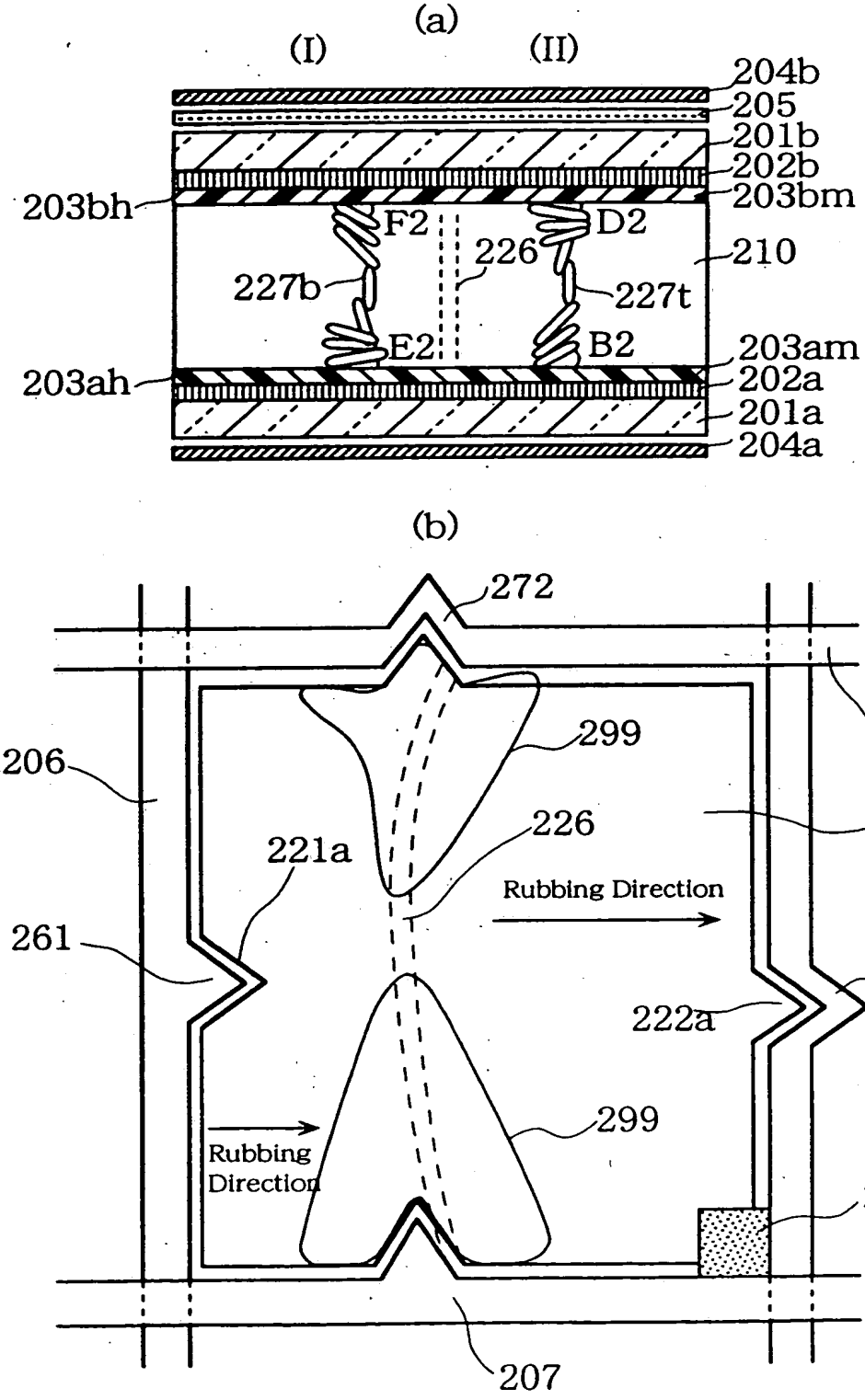

(a)
(I)
(II)
204b
205
201b
202b
203bm
203bh
F2
D2
226
210
227b
227t
E2
B2
203am
203ah
202a
201a
204a
(b)
272
207
299
206
226
202a
221a
Rubbing Direction
261
262
222a
299
Rubbing Direction
208
207

Fig. 26

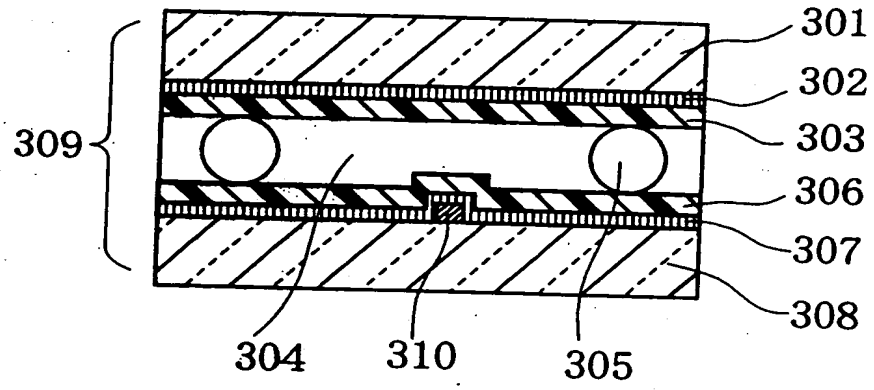


Fig. 27

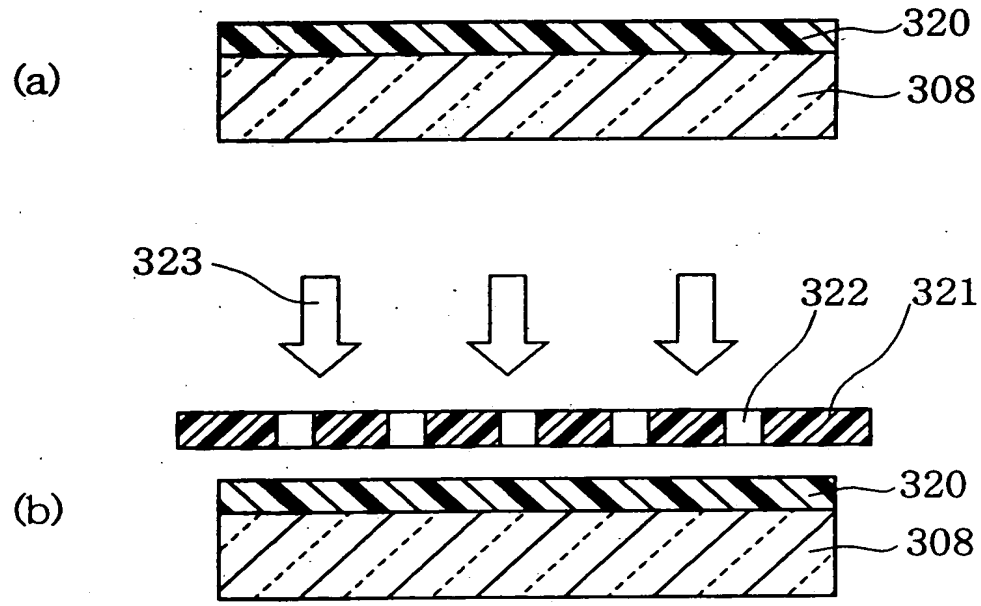


Fig. 28

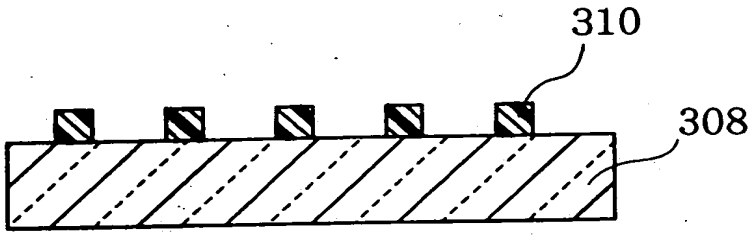


Fig. 29

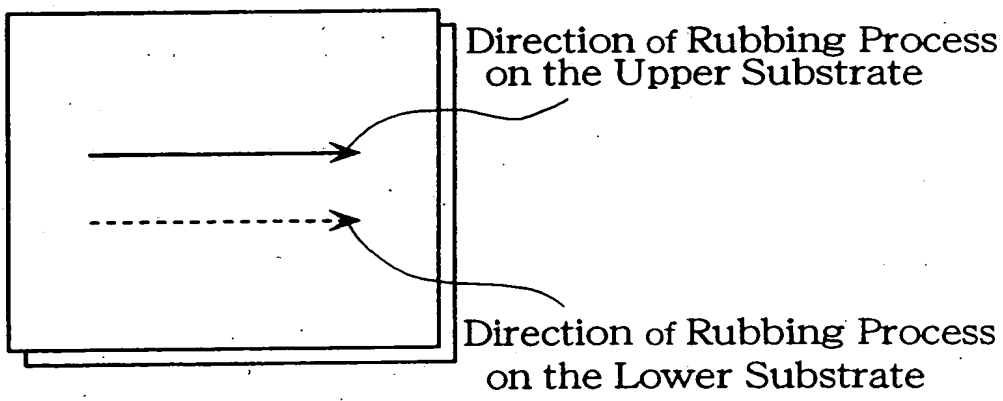

Direction of Rubbing Process
on the Upper Substrate
Direction of Rubbing Process
on the Lower Substrate

Fig. 30

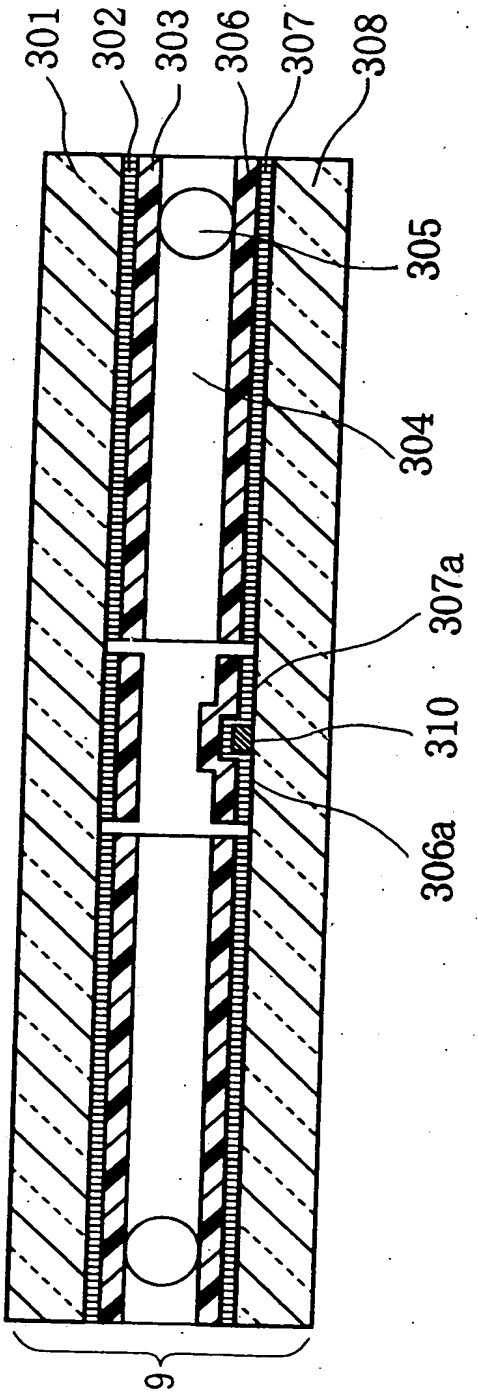


Fig. 31

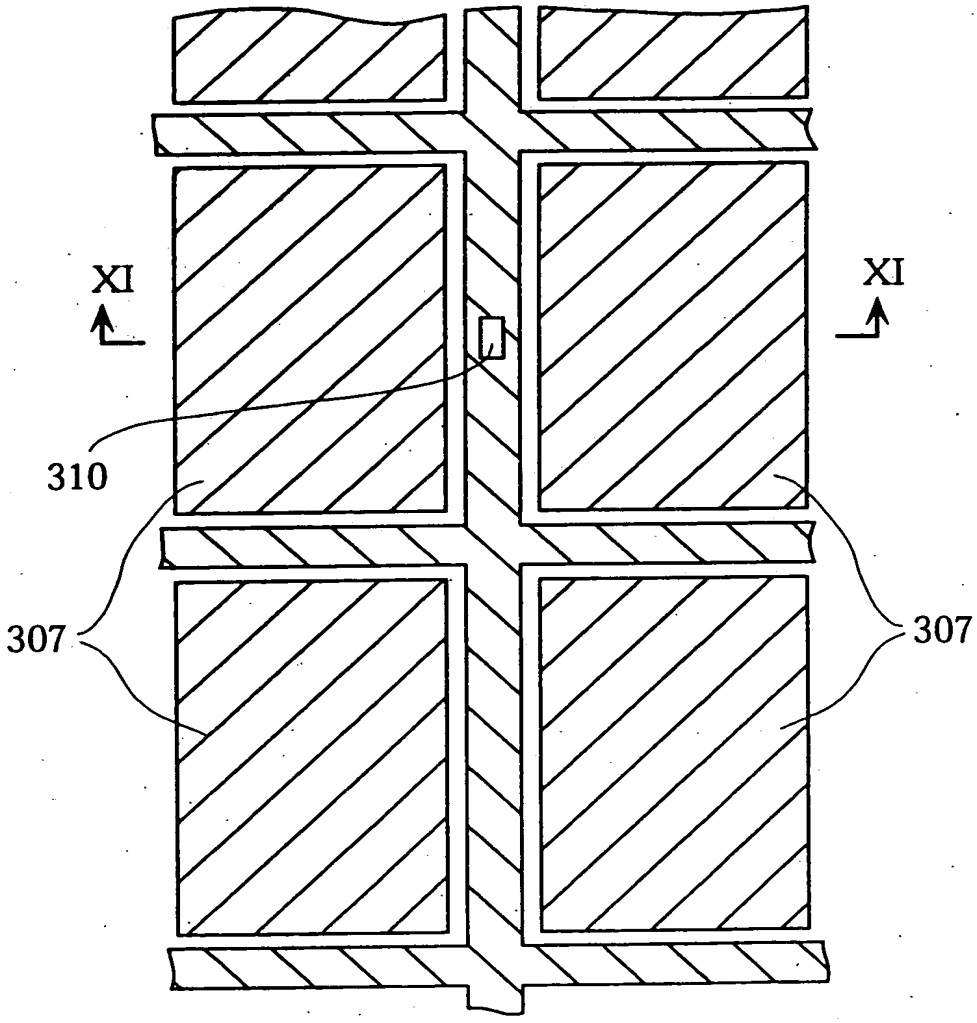


Fig. 32

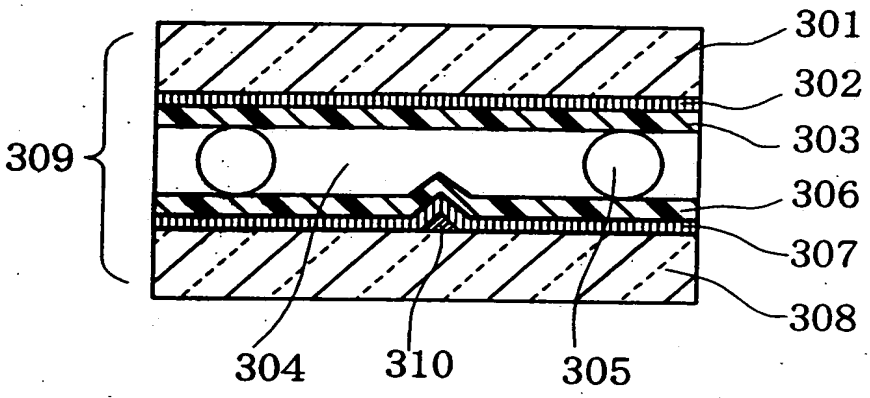


Fig. 33

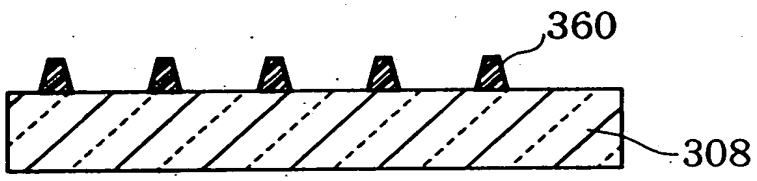


Fig. 34

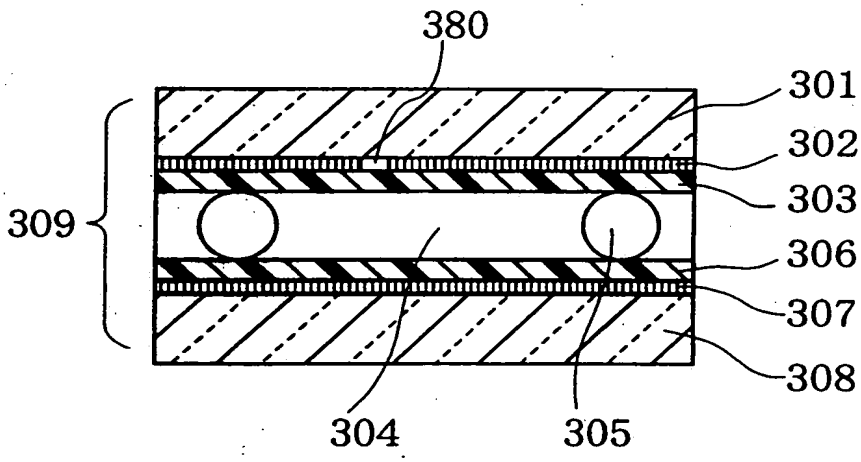


Fig. 35

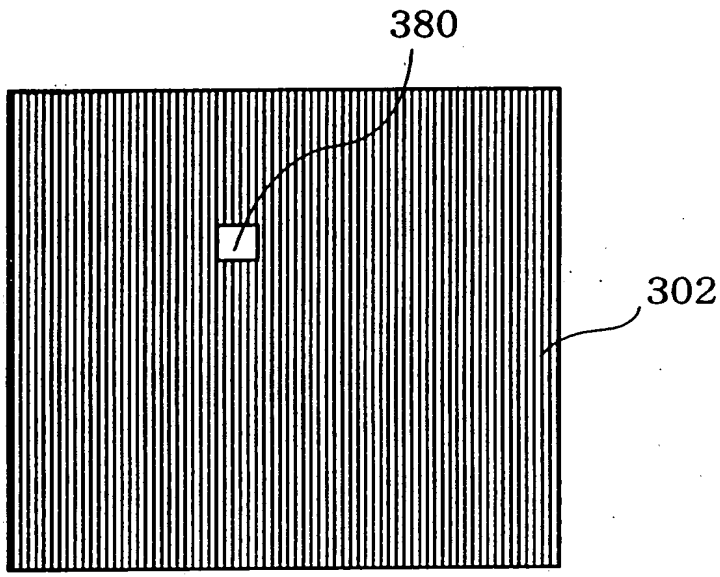


Fig. 36

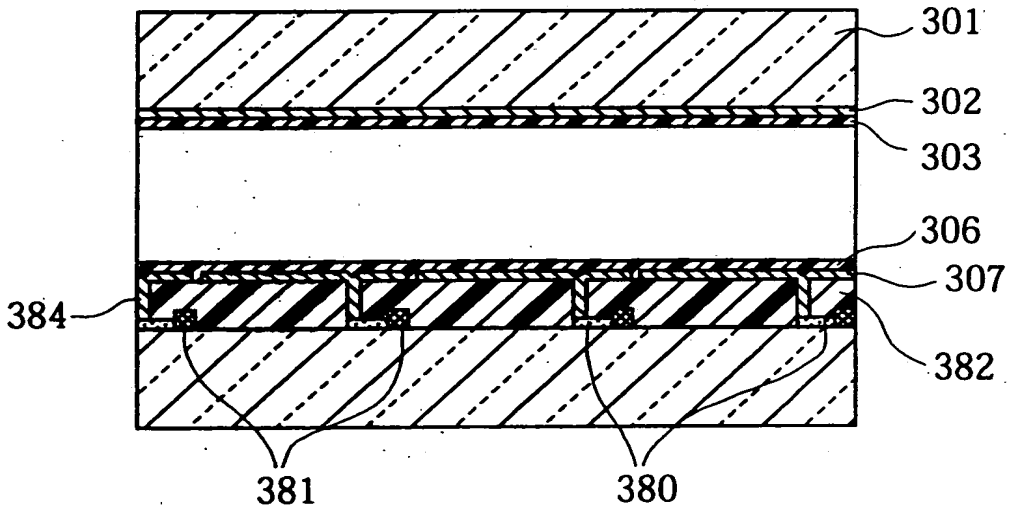


Fig. 37

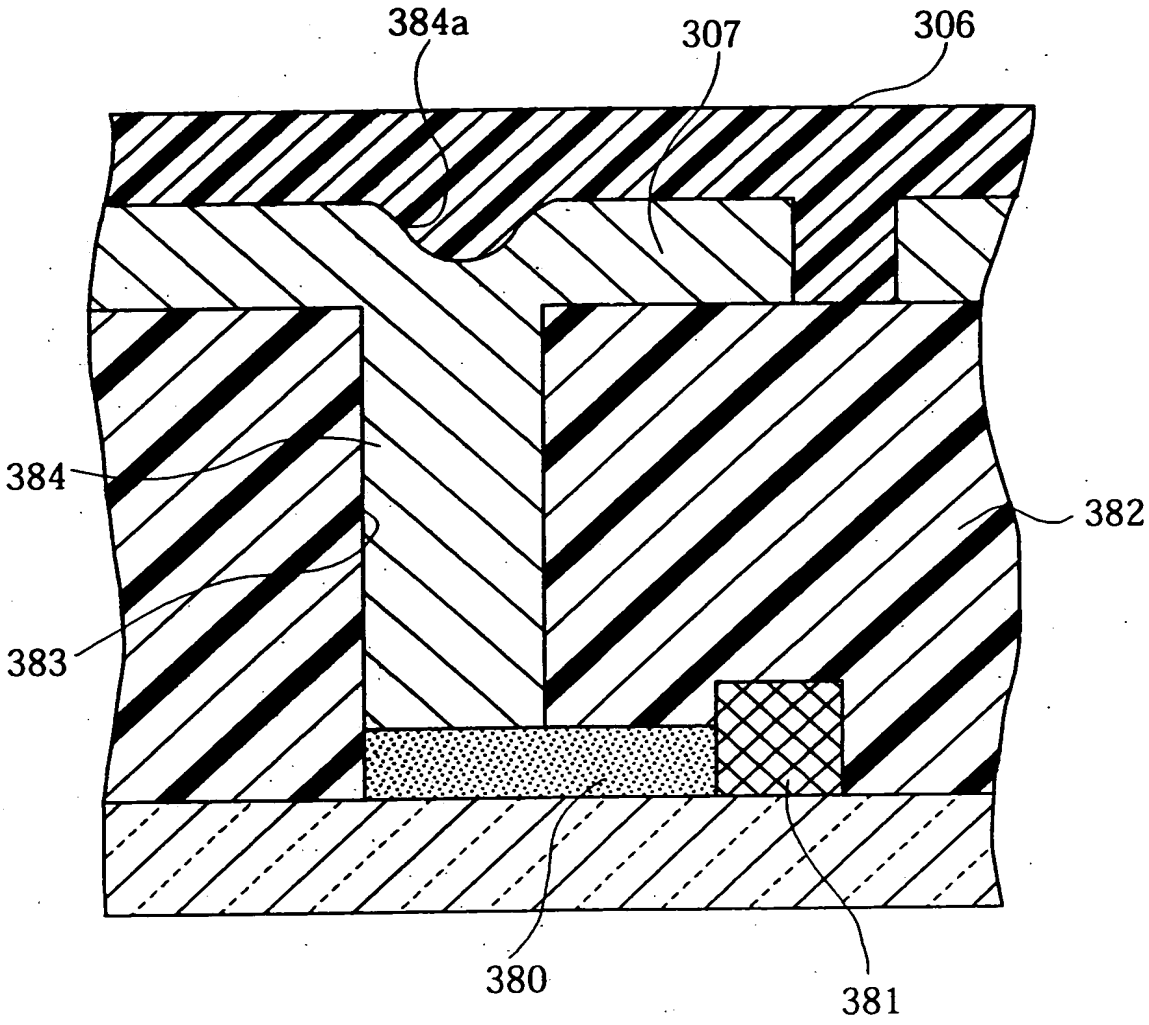


Fig. 38

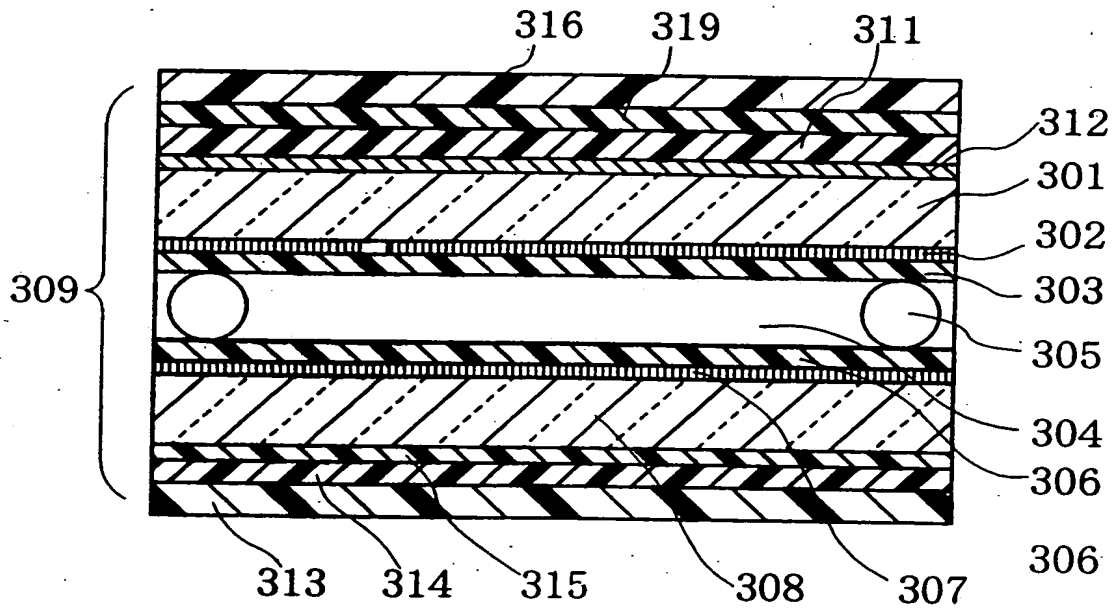
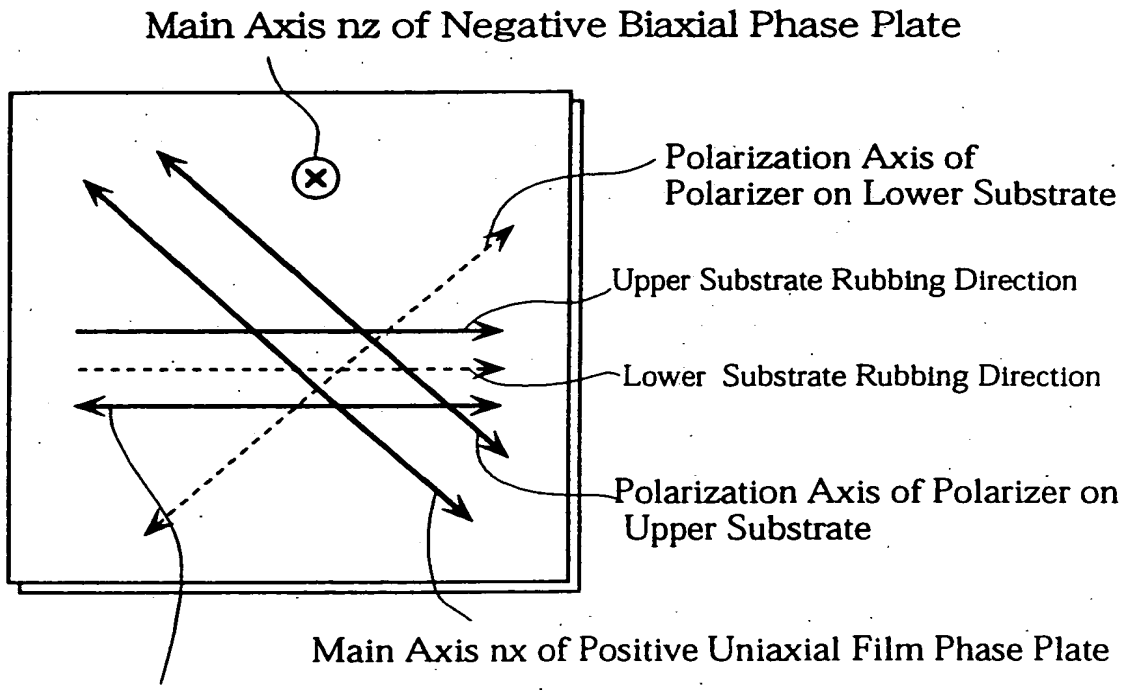

316
319
311
312
301
302
303
305
304
306
309
313
314
315
308
307
306

Fig. 39



Orthographic Projection into the Substrate Plane of the Main Axis of Phase Difference Plate Made of an Optical Medium with Negative Reflective Index Anisotropy Whose Main Axes in Hybrid Arrangement

Fig. 40

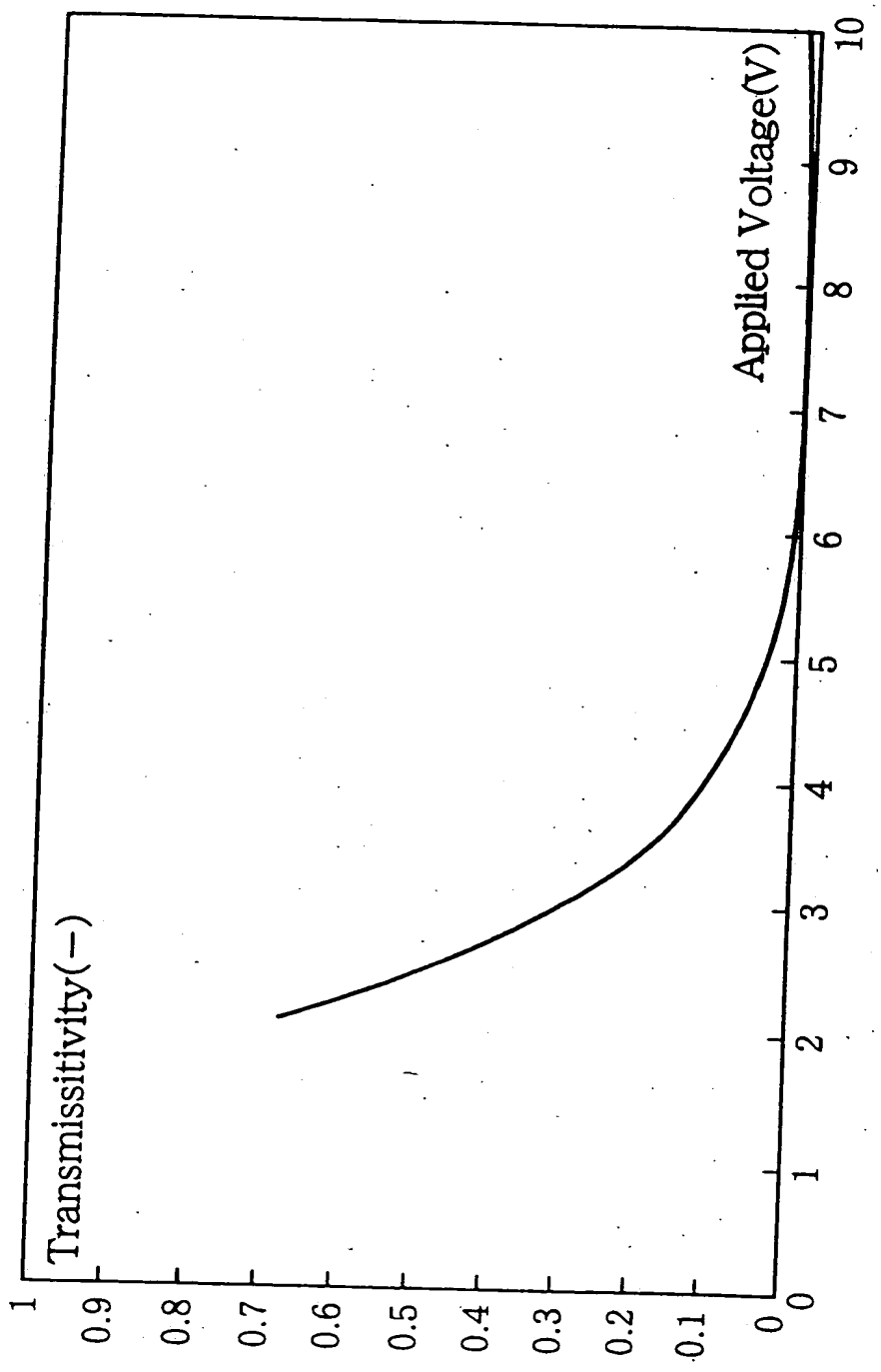

Transmissitivity(−)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1
2
3
4
5
6
7
8
9
10
Applied Voltage(V)

Fig. 41

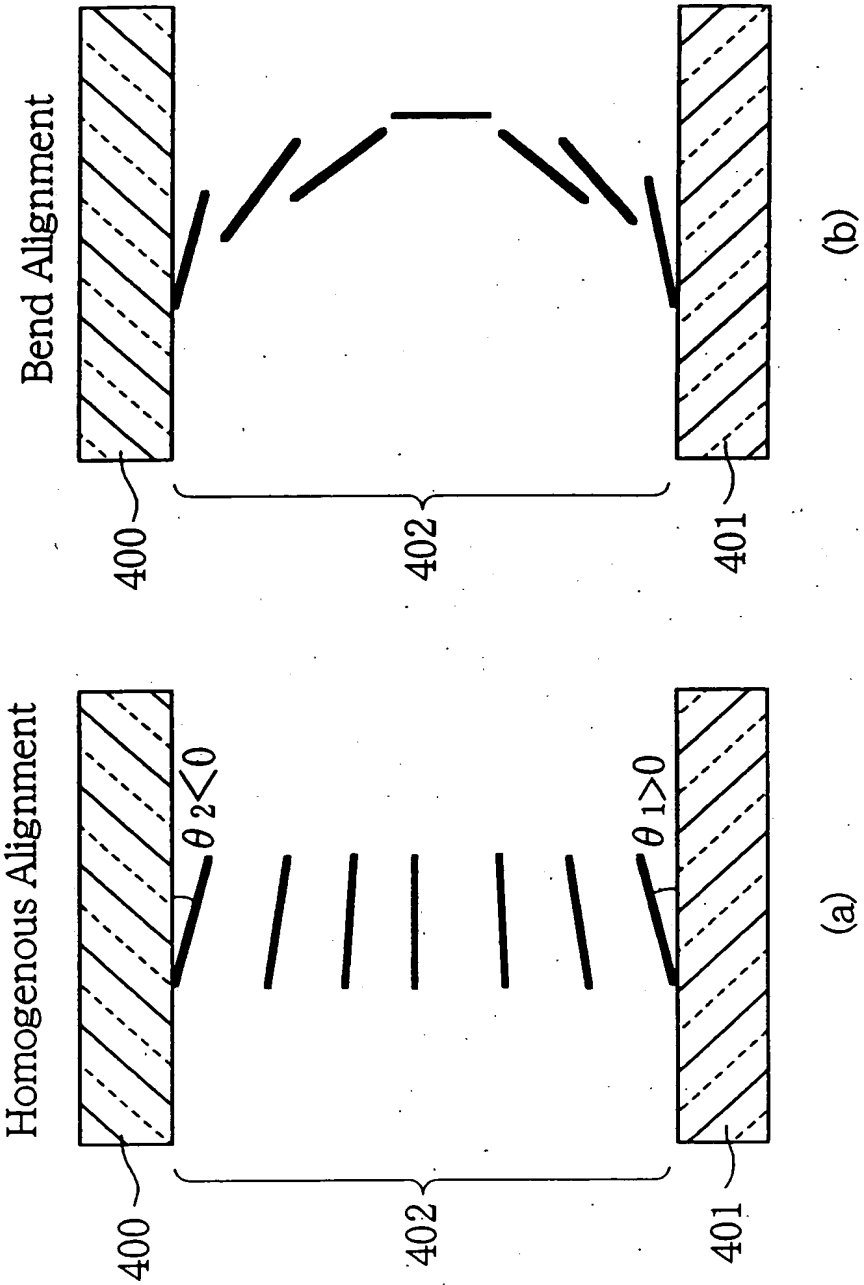

Bend Alignment
400
402
401
(b)
Homogenous Alignment
θ2<0
θ1>0
400
402
401
(a)

Fig. 42

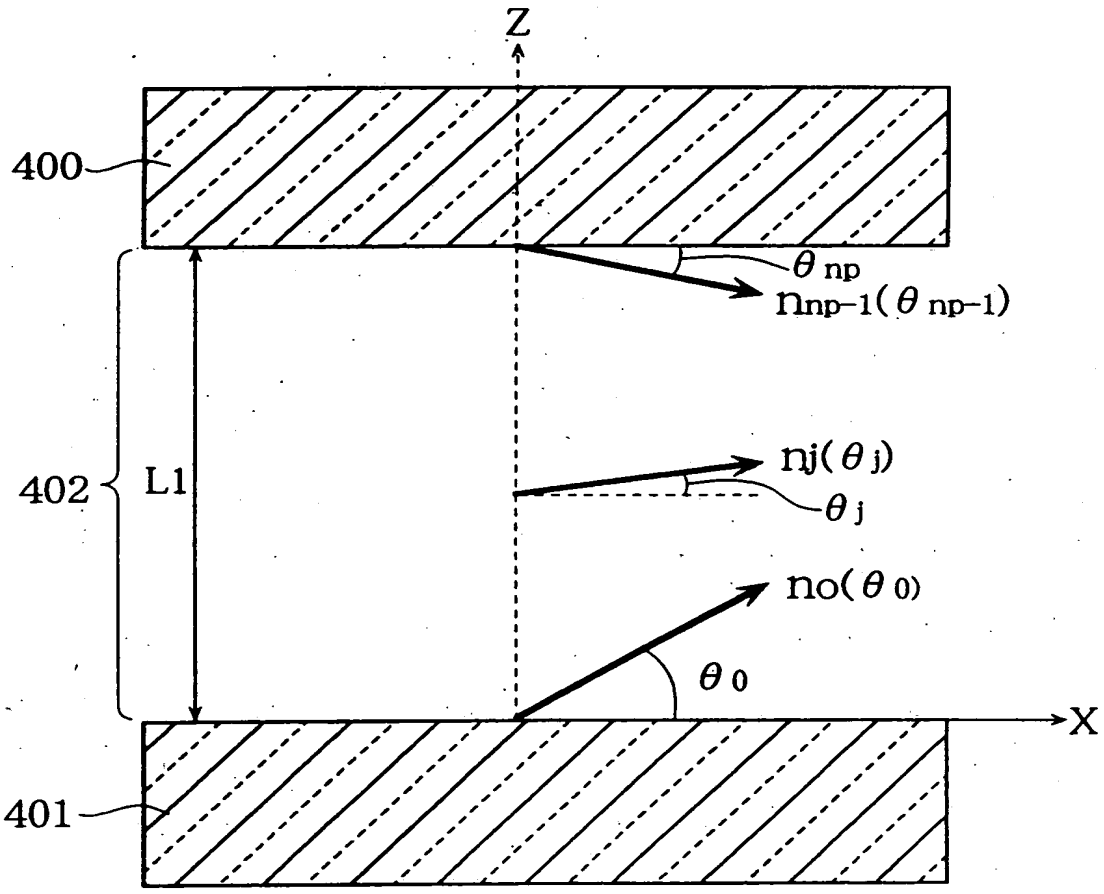


Fig. 43

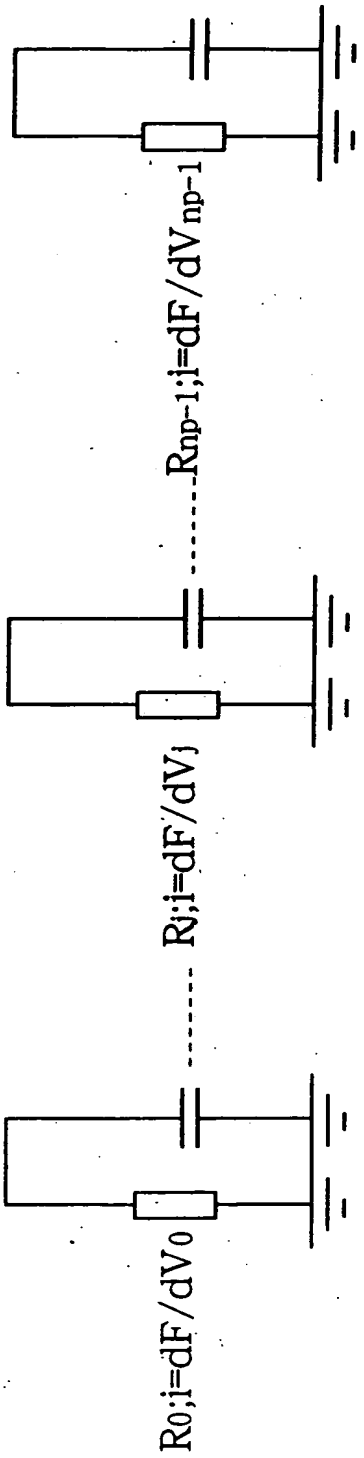


Fig. 44

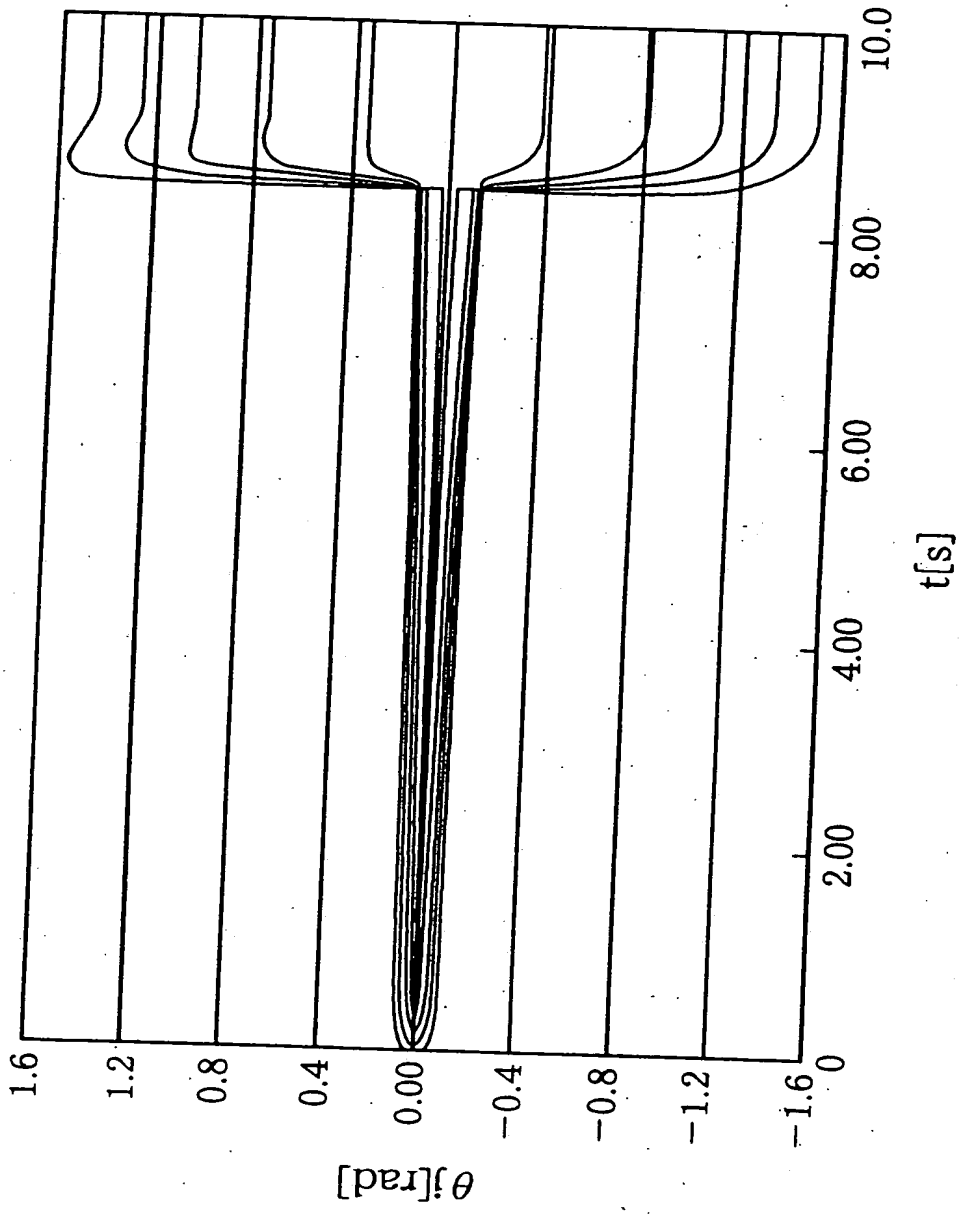


Fig. 45

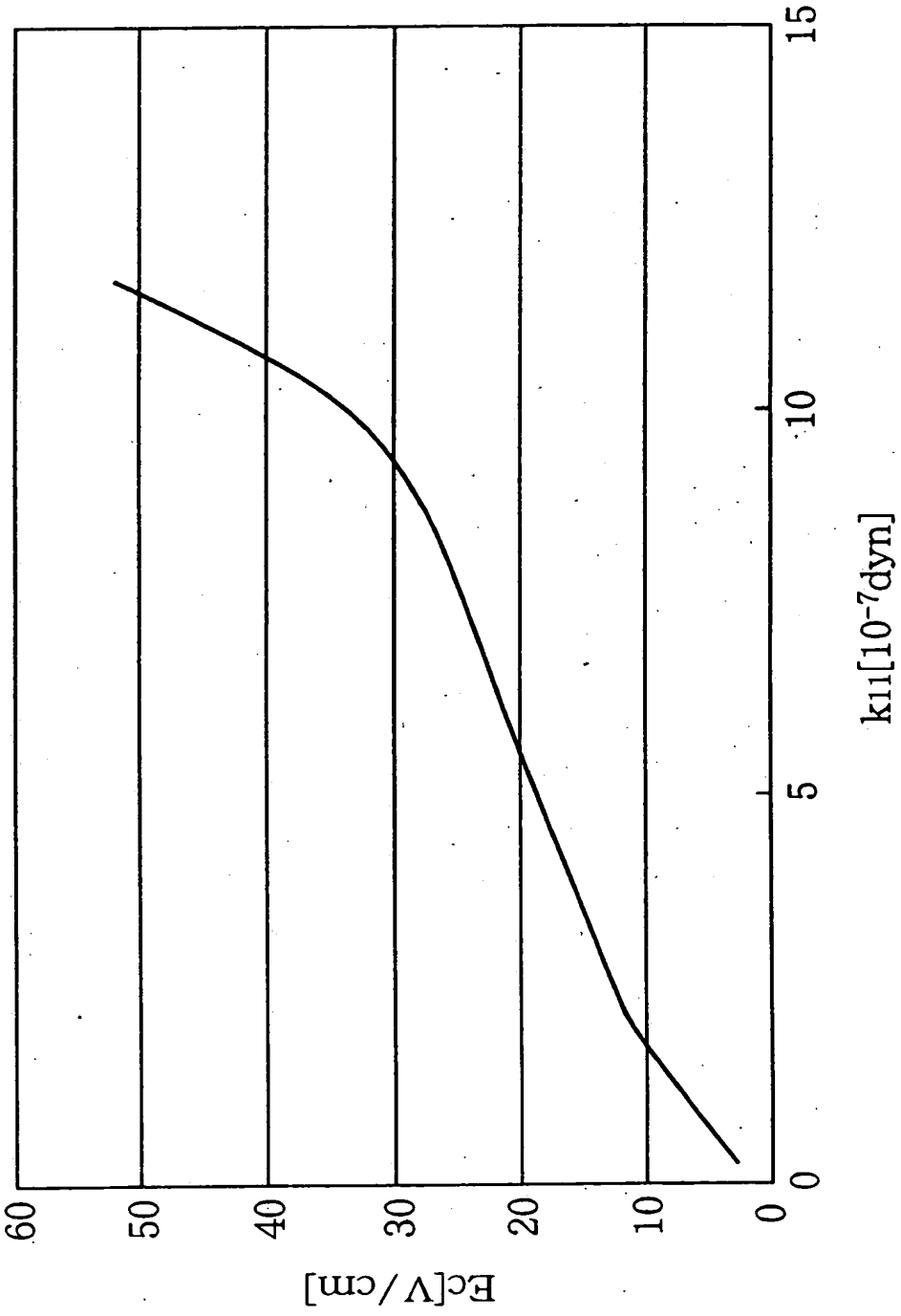


Fig. 46

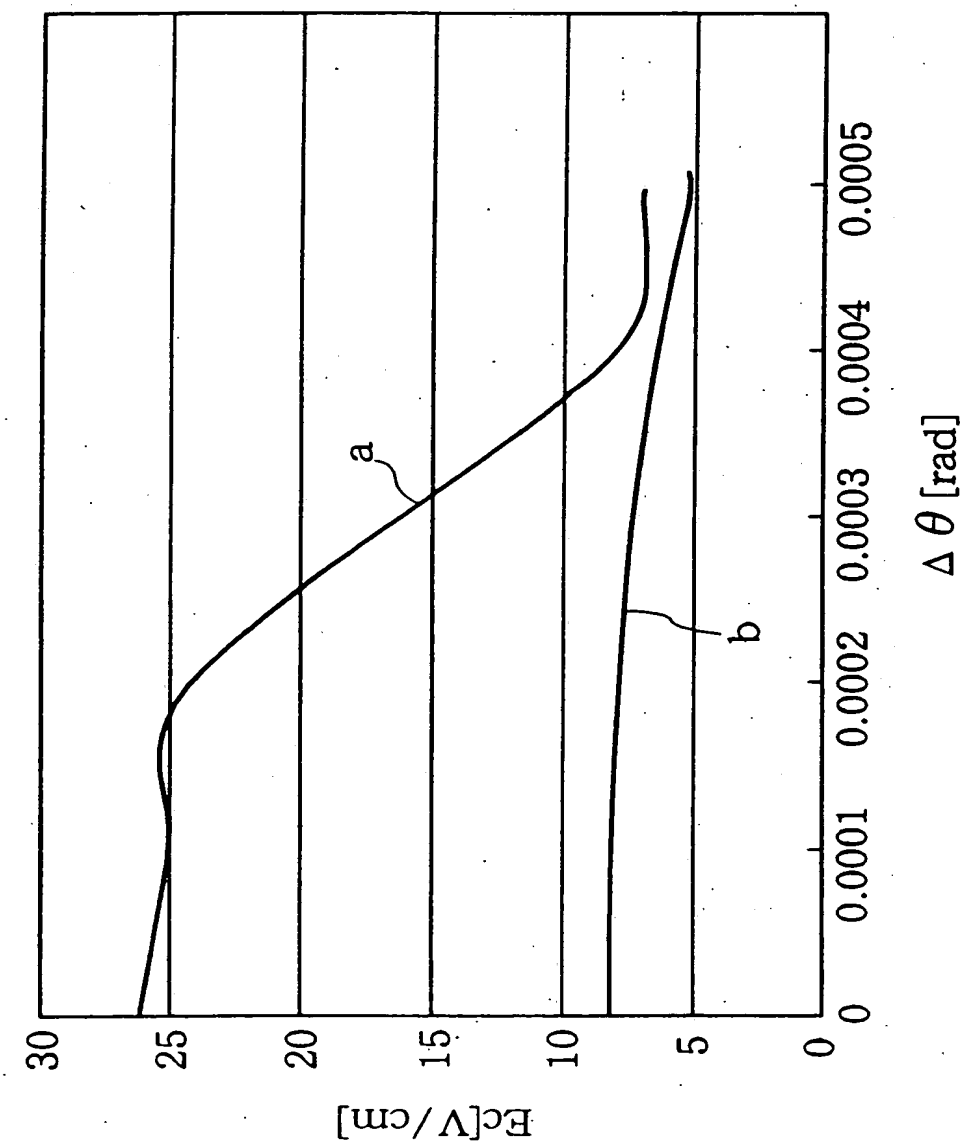

Ec[V/cm]
30
25
20
15
10
5
0
0
0.0001
0.0002
0.0003
0.0004
0.0005
Δθ [rad]
a
b

Fig. 47

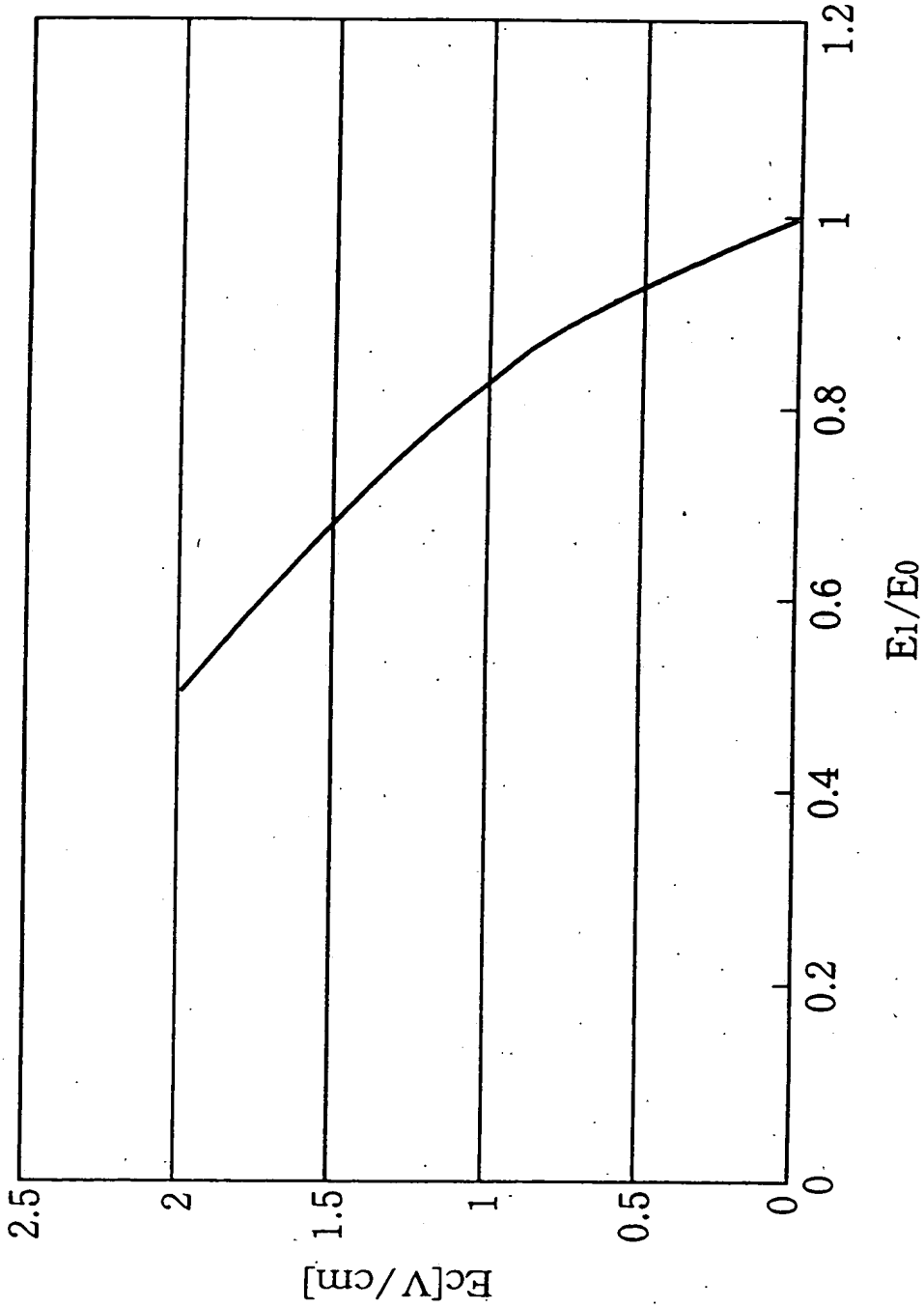
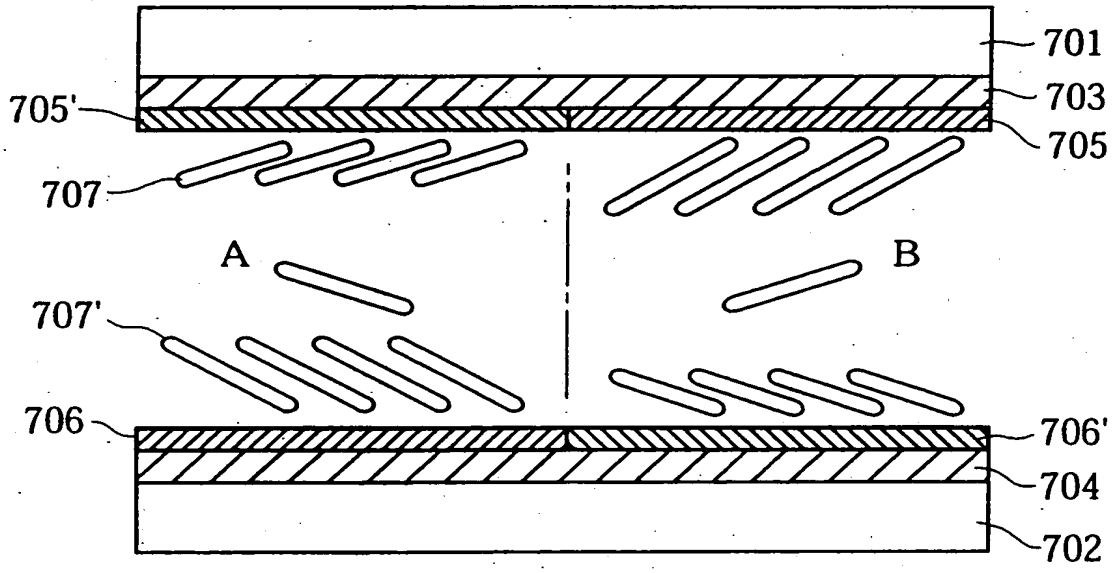



Fig. 48